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ABSTRACT

This competency-based curriculum is designed to be a handbook for courses in renewable natural resources/agriculture in Alaska. It details the competencies, developed through a survey of renewable natural resources/agriculture employers in Alaska, that such occupations require. The handbook is organized in six sections. Section I introduces the concept of competency-based curriculum and the role of vocational educators in curriculum planning and implementation. Section II provides the scope, sequence, and hierarchy of renewable natural resources/agriculture instruction. Section III presents the curriculum, including the following competencies (and related tasks): leadership/citizenship, introduction to natural resources, agricultural mechanics, animal science, plant science, soil science/agronomy, horticulture, land/water/air management, fishing and fisheries, forestry/production/processing, outdoor recreation, self-sufficiency, and wildlife use and management. Section IV contains course descriptions to assist school districts in developing their vocational programs. Section V provides curriculum analysis matrices for determining competencies to be included in specific renewable natural resources/agriculture courses. Section VI contains a sample skills card for evaluating and recording student progress. Section VII lists information on resources and specific materials available in Alaska and the rest of the nation. (KC)

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Renewable Natural Resources/ Agriculture Curriculum

Secondary and Postsecondary Articulated Curriculum

State of Alaska
Steve Cowper, Governor

Developed by the
ALASKA DEPARTMENT OF EDUCATION
Adult and Vocational Education

William Demmert, Commissioner

Karen Ryals, Acting Director for Vocational Education

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Foreword

"Self-Sufficiency" vs. "Subsistence"

The word "subsistence" has taken on a special meaning in Alaska. In a broader general usage, "subsistence" refers to a subsistence economy, an economy in which goods and services are produced and consumed locally by an indigenous population. This is in contrast to a cash economy, an economy in which money is used as a vehicle for trade and in which goods and services are traded extensively between regions and between groups of people.

In Alaska there are virtually no complete subsistence economies, but there are many groups of people who provide many products for themselves by collecting and processing local resources, especially the products of hunting, fishing, and gathering. The subsistence activities are combined with a cash economy, establishing many mixed economies throughout the state. Usually in Alaska when the word subsistence is used, what is meant is the collection of food from natural resources for local consumption (Often this definition is further narrowed to meaning the use of these natural resources by people who live in rural areas and who provide a large proportion of their total food by such means.) Some groups, especially those who have historically used particular natural resources or can show special need or cultural association, have been granted preferential access to certain natural resources for their own consumption. This preferential treatment has often been the center of much debate within Alaska.

It is not our purpose here to address the controversies regarding subsistence, but to present the various skills necessary to live a "subsistence lifestyle" in Alaska. To incorporate those skills not necessarily historical, but which can be termed a "self-sufficient" lifestyle, we will, for the purposes of this curriculum use the term "self-sufficiency" in place of subsistence.

This competency-based curriculum is designed to be a handbook for renewable natural resources/agriculture in Alaska. It includes competencies a student will acquire in Renewable Natural Resources/Agriculture. Such courses cover the following areas: **Horticulture; Animal Science; Soil Science/Agronomy; Agricultural Mechanics; Land, Air and Water Management; Forestry; Fishing and Fisheries; Outdoor Recreation; Self-Sufficiency; and Wildlife Use and Management.**

Development of this handbook began with a survey of Alaskan renewable natural resources/agriculture employers. Their priorities regarding the skills and knowledge students need to acquire to survive and thrive in the industry form the basis of this handbook. For example, industry's emphasis on the importance of communication and personal skills is reflected in the Employability Skills area of the Leadership/Citizenship unit.

This handbook stresses the importance of understanding the forces affecting Alaska's renewable natural resources/agriculture. Most units begin with definition of terms and principles so that students will have conceptual frameworks for adding the details of various techniques.

The ten areas of concentration, while not intending to be comprehensive and inclusive of all employment in renewable natural resources/agriculture in Alaska, concentrates on major areas. The competencies and tasks are presented so that instructors have the prerogative to determine which aspects they want to teach in either overview course(s) or in specialty courses. Natural Resources areas were organized along the following lines: I. Work With the Resource, II. Use the Resource, III. Manage and Protect the Resource, IV. Define the Resource V. Understand the Importance of the Resource, VI. Understand Competing Uses so that students can obtain hands-on experience and then theoretical knowledge. Agriculture areas were generally organized in the way that agriculture is taught.

The handbook is organized in six sections:

Section I introduces the concept of competency-based curriculum. The role of vocational educators in curriculum planning, implementation and evaluation is also included.

Section II provides the scope, sequence and hierarchy of Renewable Natural Resources/Agriculture competencies.

Section III presents the curriculum including the competencies and tasks for natural resources agriculture instruction.

Section IV contains course descriptions to assist school districts in developing their vocational programs.

Section V provides curriculum analysis matrices to be used to determine competencies to be included in specific renewable natural resources/agriculture courses.

Section VI contains a sample skills card for evaluating and recording student progress.

Section VII lists information on resources and specific materials available in Alaska and the rest of nation.

It is recommended that all students participate in career awareness and exploration experiences to help them understand the connection between school, work and, career plans.

Acknowledgments

Special appreciation is expressed to **Richard Steele** who authored this handbook, and to **Mark Hanson**, Associate Director of the **South East Regional Resource Center**, who administered this project.

This handbook reflects the competencies for entry-level employment in targeted renewable natural resources/agriculture industries. It reflects input from numerous Alaskan natural resource professionals. Thanks and recognition go to the following companies, corporations, offices, and associations for their assistance in completing the natural resources survey and for their suggestions and additions:

Alaska Guide Board
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Cooperative Extension Service
Denali National Park
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Bob's Landscaping Service
Custom Landscapes
Custom Tree Services
Dirty Prince Design & Land
Echo Lake Nursery
Goldbug Greenhouse
Green Acres Landscaping
Homer's Green Thumb
Flower Blossom Greenhouse
Kleinert's Landscaping
Landscapes by Design
Nancy's Lakeview Nursery
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Resurrection Greenhouse
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Skagway Gardens
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Valley Hydro Seed
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Wintergreen Farm

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Dennis Steffy, Mining and Petroleum Training Service, Soldotna
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Jim Preston, Juneau Douglas High School
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Karen Ryals, Acting Director
Office of Adult and Vocational Education
Alaska Department of Education
January 1988

Introduction to Competency-Based Curriculum

Competency-Based Curriculum

Vocational education should be directed toward the skills, knowledge, and attitudes needed for successful employment. Changes in technology are affecting the job requirements in renewable natural resources/agriculture. Such changes require educators to update their curriculum in order to prepare students for competition in the job market.

An effective method for delivering vocational education is through a competency-based curriculum. This curriculum is based on a task analysis of the key occupations in renewable natural resources/agriculture. Once a competency-based curriculum is set in place, student performance must be measured on levels of proficiency in those competencies. Thus, the critical features of competency-based education are:

1) validating competencies to be included in the curriculum; and
2) evaluation of student competency levels.

This curriculum handbook sets direction for local curriculum developers. It provides a framework for developing courses of study and lesson plans in local schools.

Curriculum Based On Competencies

Competence refers to the adequate performance of a task. The task may be evaluated according to the performance or process, the product, or both.

Competency-Based Vocational Education consists of programs that derive their content from the tasks performed in each occupation/job and assess student performance on the basis of preset performance standards.

Learning materials define the competencies the student is to learn, the criteria by which the student will be evaluated, and the conditions under which the evaluation will occur.

Competency-based instruction places emphasis on the ability to do, as well as on learning how and why. Student performance and knowledge are individually evaluated against the stated criteria, rather than against group norms.

The competency process utilizes a checklist of attitudes, knowledge, and skills that are commonly needed by entry-level employees in natural resource/agriculture occupations. In developing this curriculum handbook, a cross-section of natural resource/agriculture professionals were asked to respond to the checklist on the basis of needs within their own establishments. The checklists were tallied and summarized to determine which attitudes, knowledge, and skills were common to firms in Alaska. Also, the competencies in each area were ranked as to decreasing importance.

Student Performance Assessment

A curriculum becomes competency-based when students are assessed on the basis of their competence. Sample skill cards are provided in this guide for teachers who wish to use them in assessing the competency levels of their students. The card has four levels of proficiency which allow continued development of skills. The card can be used to monitor students' progress as they move between natural resource/agriculture classes, between teachers and grade levels and between school and work. The completed skills card is an important part of a placement portfolio when students begin their job searches.

Curriculum Delivery Systems

Leadership/Citizenship (Vocational Student Leadership Organizations)

Some of the competencies in this curriculum guide cannot be fully met in traditional classroom and lab settings. The Future Farmers of America (FFA) is a delivery system which can be integrated into the regular school program. Human relations skills as well as job skills will be enhanced by student participation in FFA. FFA activities should complement instruction in the natural resource/agriculture classroom and lab. They should be integrated as a curriculum delivery system and not allowed to become an extracurricular activity. Note that with production agriculture being somewhat limited in the state of Alaska, the situation is unique. As such, the word "farmer" in FFA is a misnomer. FFA is the organization for all renewable natural resources/agriculture students. FFA is for students interested in tanning, hunting, wildlife, forestry--all areas of renewable natural resources, including farming and agribusiness.

Supervised Occupational Experience Program (SOEP), Cooperative Vocational Education (Coop) and On-the-Job Training (OJT)

Some of the competencies identified in this guide cannot be fully developed at a school site. The Future Farmers of American's Supervised Occupational Education Program (SOEP), Cooperative Vocational Education (Coop) and On-the-Job Training (OJT) all allow students to gain work experience. SOEP, Coop and OJT inspire personal volition and boost citizenship. FFA materials provide a detailed plan for SOEP's by year. These materials assist with Coop and OJT Such a framework can easily match a four-year program in combined Renewable Natural Resources/Agriculture, Natural Resources alone, or Agriculture alone. The competencies for SOEP arel:

Competency: **Understand SOEP**

Tasks:
Recognize the Supervised Occupational Experience Program (SOEP) as part of vocational education
Identify interests in a particular field of renewable natural resources/agriculture
Explain the relationship between classroom laboratory instruction, SOEP, and Vocational Student Leadership Organizations (such as FFA)
Identify types of SOEP's and their potential locations
Describe the assistance needed in developing an SOEP

Competency: **Develop an SOEP ownership program**

Tasks:
Identify competencies to develop through ownership SOEP
Set goals for ownership SOEP
Plan an ownership SOEP
Implement the SOEP plan
Explain why ownership SOEP program records are important
Evaluate and analyze SOEP progress (records and competencies)

Competency: **Develop an SOEP placement program**

Tasks:
Describe the characteristics of a good placement program
Plan a placement SOEP program
Identify an appropriate SOEP placement station
Implement the SOEP plan
Explain special concerns with cooperative placement
Maintain records of competencies and earnings/costs
Evaluate and analyze progress

Competency: **Analyze an SOEP**

Tasks:
Develop financial statements
Interpret and use financial statements
Develop skills (competency) scales
Analyze SOEP programs
Evaluate and revise SOEP's based on analysis

Competency: **Expand SOEP'S**

Tasks:
Describe how to assess the success of SOEP'S
Summarize SOEP records
Develop plans for expanding SOEP's
Apply SOEP skills to the real world of work

A work station in the community offers realistic experiences in fulfilling the program goals in career development and human relations. Cooperative Vocational Education offers an excellent vehicle for the delivery of instruction. With well developed training plans, teachers and employers can cooperate to prepare students for employment. Cooperative Vocational Education extends the instructional program beyond the availability of equipment and instructor time at the local school. Teachers and employers must maintain regular communications to assure that students are receiving a high quality experience. Cooperative Vocational Education is sometimes called On-the-Job Training (OJT) A well-organized and structured Supervised Occupational Experience Program (SOEP) can accomplish the same purpose as Cooperative Vocational Education or OJT.

Other programs offering work experience include the Rural Student Vocational Program (RSVP) and The Job Training Partnership Act. RSVP provides a two-week full time work experience for students from rural areas where job stations are limited or non-existent. JTPA provides on-the-job experience to disadvantaged youth in both urban and rural areas.

Role of Instructor in Curriculum Planning, Implementation and Evaluation

The vocational instructor fulfills many roles which include the following responsibilities:

- Prepares a written vocational program plan.
- Develops and maintains a written program philosophy with objectives that support the philosophy.
- Maintains a written list of competencies identified as needed for the program area.
- Devises and maintains a classroom management system for implementing the curriculum materials provided for the program area.
- Evaluates the curriculum content periodically to determine curriculum changes and updates. This includes the involvement of the students (present and former), advisory committee members, and other personnel.
- Selects units of instruction and plans lesson plans based on the competencies of the occupation.
- Provides appropriate instructional materials, supplies, and equipment for the students to use.
- Provides school guidance counselor with information and updates regarding implementation of the specific curriculum.
- Works to actively recruit, retain and maximize success of non-traditional students (those students who; by virtue of their grades, have traditionally been excluded from this content area)
- Assists students in planning and conducting Supervised Occupational Experience Programs (SOEP), Cooperative Vocational Education (Coop) and/or On-the-Job Training (OJT).
- Reviews the instructional materials to assure that they are free from sex bias and sex role stereotyping.
- Works with an advisory committee.
- Assists and/or serves as an advisor to the appropriate student organization (FFA) related to the vocational program area.
- Plans and arranges an appropriate classroom learning environment. This involves assisting students of different abilities to work at their own pace and in cases where remedial instruction is needed, securing additional help for those students.
- Reinforces basic skills of reading, communication (written & oral) and computation through vocational education experiences.
- Helps determine what objective(s) should be established for students with special needs as a part of the Individual Educational Plan (IEP) development.

- Uses a grading procedure that is made available and appropriate to all students at the beginning of their program.

- Sets an example for grooming and dress that is generally found in the occupational area in business or industry to enable students to establish appropriate standards.

Benefits of Competency-Based Curriculum

Competency-based vocational education offers several benefits to students:

1. The competencies/tasks are directed to the student and provide measurable criteria for determining when the student has acquired the necessary knowledge and skills.

2. Students receive realistic training for the job. They become competent in tasks that are relevant to the occupation.

3. Students know what is expected of them throughout the course. The competencies are made available to them at the onset. They know what they will be doing and how well it must be done.

4. Each student is individually responsible for completing each competency attempted in the curriculum.

5. Students are not compared with other students in their accomplishments because each is expected to work according to his/her individual capabilities and learning style. Because of the various evaluation policies of different school systems, the ideal of not comparing students in determining grades is not always possible. However, the basic thrust of the competency-based program is to evaluate each student according to his/her accomplishment of each task as he/she works up to individual capability.

II
Program Development

Program Development

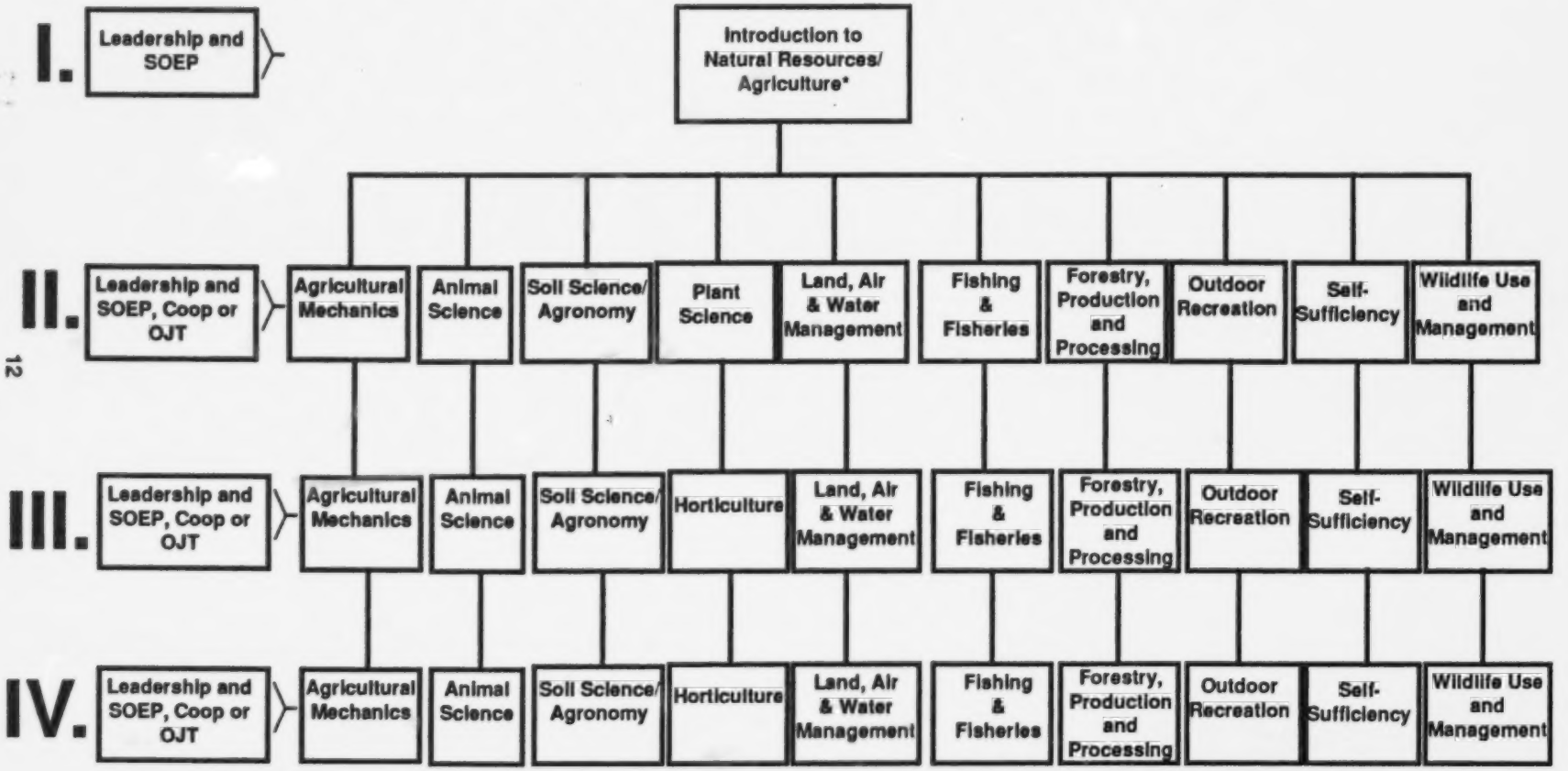
The format of this handbook was selected to aid administrators and teachers in concentrating on the skills needed for vocational training. It will assist in selecting the array of units and the delivery system which fit the school. This provides the flexibility of varying the course content to include the most valuable skills as appropriate for the scope and sequence. The primary importance is that students are able to secure foundation skills. Schools can vary their delivery systems to maximize student opportunities by:

1. Offering courses on alternate years or other planned sequences
2. Offering two or more courses in the same class
3. Providing individualized materials and instruction

Matrices are included in this guide for use in planning the courses to be offered and the content of each course.

The following charts show a hierarchy of Renewable Natural Resources/Agriculture competencies that are emphasized for Natural Resources, Agriculture, or for a combination of both areas:

Hierarchy of Competencies for Combined Renewable Natural Resources/Agriculture



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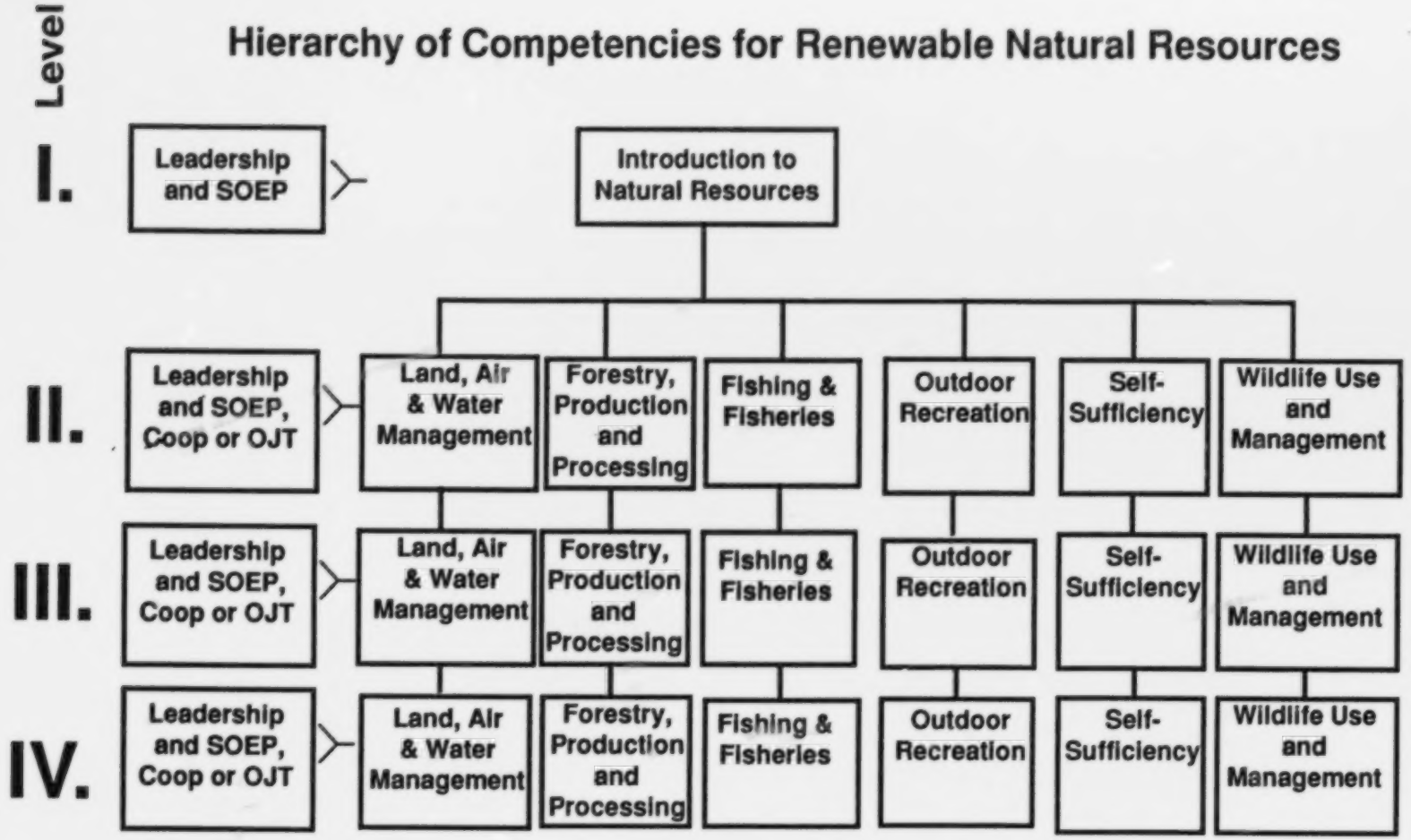
***Note:** Leadership/Citizenship and Supervised Occupational Education Program (SOEP) belong in all four levels. Cooperative Vocational Education (Coop) and On-the-Job-Training (OJT) belong mainly in the last three years.*

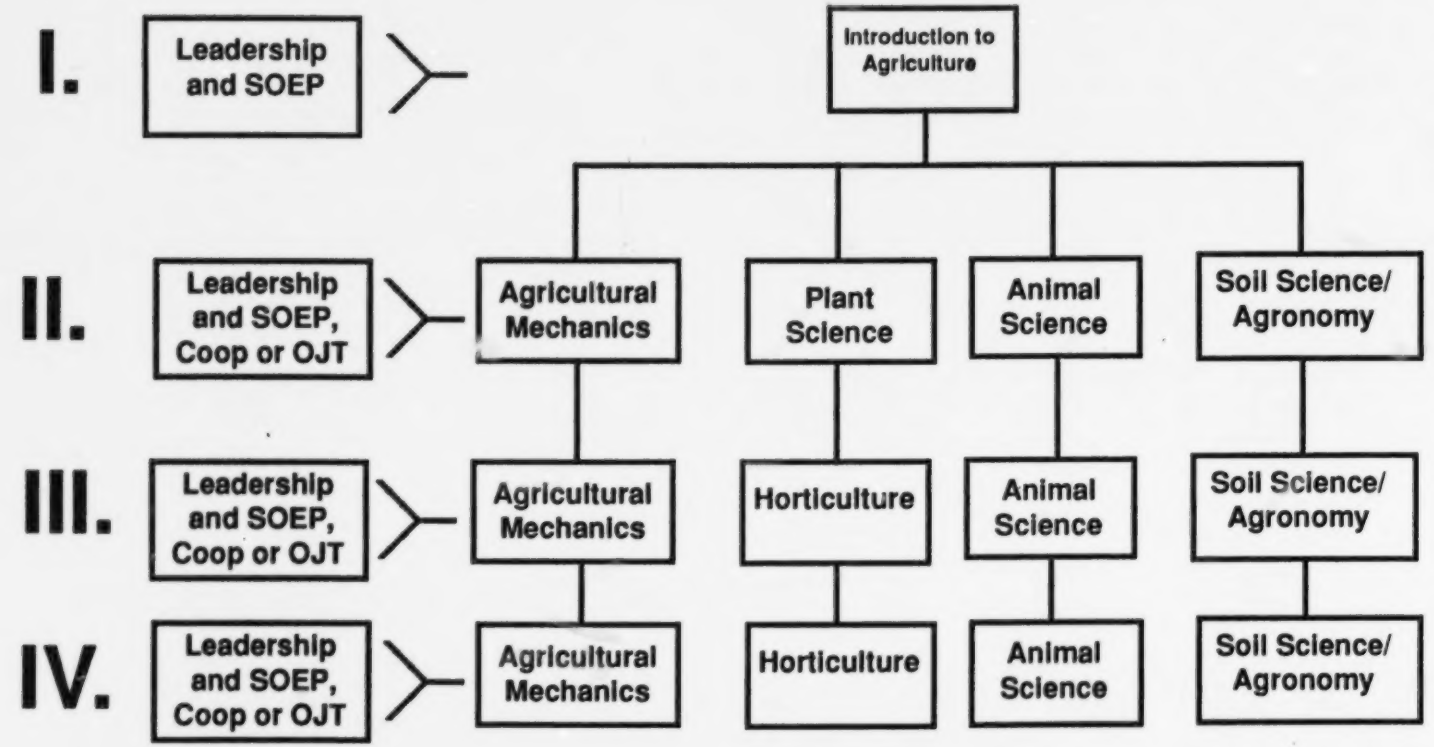
** "Introduction to Natural Resources/Agriculture" is comprised of Leadership and SOEP, Introduction to Natural Resources, and Level I of Agriculture Thrust.*

Hierarchy of Competencies for Renewable Natural Resources



Note: Leadership/Citizenship and Supervised Occupational Education Program (SOEP) belong in all four levels. Cooperative Vocational Education (Coop) and On-the-Job-Training (OJT) belong mainly in the last three years.

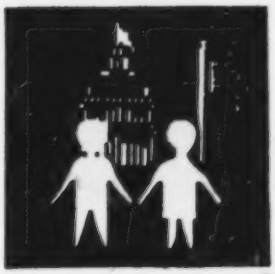
Hierarchy of Competencies for Agriculture



Note: Leadership/Citizenship and Supervised Occupational Education Program (SOEP) belong in all four levels. Cooperative Vocational Education (Coop) and On-the-Job-Training (OJT) belong mainly in the last three years.

III
Competencies and Tasks

Leadership/Citizenship



Competency: Understand leadership

Tasks: Attain self-worth by:
- a. working in committees
- b. defining self-esteem and explaining its importance
- c. practicing eye contact
- d. firmly greeting others with a handshake
- e. using presentation skills

Refine social skills
Refine communications skills

Competency: Use effective leadership skills

Tasks: Describe the Future Farmers of America and how it promotes leadership skills:
- a. Participate in meetings according to rules of parliamentary procedure
- b. Function effectively on committees by accepting assigned responsibilities
- c. Plan and conduct effective group leadership activities
- d. Participate in society in a democratic way
- e. Be punctual and dependable
- f. Follow rules, standards and policies
- g. Work cooperatively with others

Identify leadership characteristics and responsibilities
Speak in public including:
- a. speaking formally
- b. speaking informally
- c. teaching individuals and groups
- d. testifying at a public hearing
- e. discussing in a group

Participate in leadership activities

Competency: Use parliamentary procedures

Tasks: Identify voting procedures
Conduct a meeting
Identify types of motions and their order of precedence

Competency: Demonstrate initiative and productivity

Tasks: Organize time effectively
Be responsible
Care about the quality of work

Competency: **Demonstrate work maturity**

Tasks:
Describe the importance of openness to new situations
Demonstrate characteristics of the mature person:
- a. self-acceptance
- b. consideration and respect for others
- c. self-control
- d. positive thinking and attitudes
- e. flexibility
- f. initiative

Identify ways to develop and maintain good work relationships
Differentiate between personal and job-related problems
Follow orderly and systematic work behavior

Competency: **Be honest**

Tasks:
Define honesty and integrity
Explain how to deal with theft and dishonesty
Relate employee integrity to overall company performance

Competency: **Be reliable and dependable**

Tasks:
Maintain acceptable attendance records
Be on time
Give timely notice of interruptions to work schedule
Follow rules of work site or training site

Competency: **Solve problems**

Tasks:
Explain the importance of having a method for analyzing and solving problems
Use the problem-solving process:
- a. identify problems
- b. obtain information
- c. analyze problems
- d. develop and analyze alternative solutions
- e. choose a course of action
- f. persevere through hardships
- g. recognize and change otherwise unworkable solutions
- h. repeat process as necessary to refine solutions

Competency: **Be assertive**

Tasks:
Differentiate between assertive, aggressive, and passive behavior
Discuss whom to go to for employee problems

Competency: **Maintain good personal relations**

Tasks:
Use positive attitudes with others
Accept supervision and criticism
Cooperate with others
Accept the chain of command

Competency: **Follow verbal and written directions**

Tasks:
Ask for clarification
Use listening skills
Review situations of poor communications
Read directions when assembling and repairing equipment

Competency: **Deal effectively with clients**

Tasks:
Greet the client
Talk politely to client
Obtain all necessary information from client in writing
Identify the business on the telephone
Relay client complaints to employer

Competency: **Understand how to be an entrepreneur**

Tasks:
Explain terms and principles associated with entrepreneurship
Describe the role of self-employment in the free enterprise system
Identify types of business organizations including:
a. sole proprietorship
b. limited partnership
c. partnership
d. corporation
Identify personal traits necessary for self-employment
Identify risks and rewards of starting a new business
Identify the role small businesses have played in job creation and new products and services

Employability Skills

Competency: **Work safely**

Tasks:
Inspect equipment and facilities for safety and health hazards
Follow safe work habits
Wear appropriate protective clothing
Use proper lifting and carrying methods
Identify personal hygiene and sanitation practices
Interpret information on labels and signs
Apply first aid
Maintain and adjust safety shields and devices
Identify consequences of not following safety precautions
Follow all safety precautions when using pesticides and farming and welding equipment
Identify the procedures and requirements for obtaining a restricted use pesticide applicator's license

Competency: **Prevent work-related injuries**

Tasks:
Describe the importance of safe working attitudes
Describe first-aid and CPR
Discuss the importance of wearing protective gear including:
- a. hardhats
- b. eye and ear protection
- c. respirators
- d. gloves
- e. chaps
- f. safety lines
- g. boots and steel-toed boots

Describe safety procedures for:
- a. boats and aircraft
- b. chemicals and explosives
- c. construction materials
- d. driving
- e. hand and power tools
- f. hazardous wastes and carcinogens
- g. soldering
- h. wildlife and domestic animals
- i. working in enclosed areas
- j. heavy equipment
- k. ladders and scaffolds
- l. lifting
- m. noise
- n. electricity
- o. extreme weather conditions
- p. flammables
- q. pest control

Discuss special safety considerations relevant to each renewable natural resources/agriculture area
Drive safely

Competency: **Follow OSHA guidelines**

Tasks:
Explain the purpose of the Occupational Safety and Health Act
Describe your rights under workers-right-to-know and other portions of the act
Discuss how to resolve hazardous and OSHA violations situations

Competency: **Maintain good health for effective job performance**

Tasks:
Explain the relationship between regular exercise, adequate rest, nutrition, and job performance
Explain the issue of smoking on the job
Explain drug abuse as it relates to job performance
Explain the hazards of infectious diseases and how to avoid them

Competency: **Identify personal responsibilities related to employment**

Tasks:
Explain the importance of:
- a. securing adequate transportation
- b. identifying adequate child care alternatives
- c. inventorying independent living skills
- d. developing a personal finance plan

Explain employer's expectations regarding substance abuse

Competency: Identify career choices

Tasks: Conduct a self-assessment:

a. assess values in relation to work
b. recognize skills and aptitudes
c. assess employment history and experience
d. describe obstacles to employment

Identify career clusters:

a. list specific jobs and duties within clusters
b. describe apprenticeship/training programs
c. describe advanced training opportunities

Use labor market information:

a. identify how to find job information
b. describe the current local, state, national and international labor market
c. identify growth/demand occupations
d. relate career choices to local labor market

Select a career goal:

a. list how skills could be used in other jobs
b. develop specific steps to reach goal
c. incorporate career goals in SOEP, Coop, or OJT

Competency: Identify jobs in renewable natural resources/agriculture

Tasks: Identify educational and occupational opportunities

Locate resources for finding employment

Confer with prospective employers in the area of interest

Identify the work of:

a. agricultural carpenter
b. agricultural construction worker
c. aquaculture worker
d. arboretum worker
e. biologist
f. cannery and frozen food worker
g. choker setter
h. commercial fisher
i. dairy farmer
j. dairy processing equipment operator
k. dairy products tester
l. deckhand
m. equipment operator
n. equipment salesperson
o. faller and bucker
p. farm worker
q. farmer and rancher
r. feeds, seeds, supplies salesperson
s. fertilizer serviceperson
t. fire fighter
u. fish and game protection officer
v. fish and wildlife technician
w. floral designer
x. florist
y. florist design specialist
z. forester
aa. forestry technician
bb. fruit and vegetable grower
cc. garden center worker
dd. general livestock, crop farmer
ee geologist
ff. golf course employee
gg. greenhouse employee
hh. greenhouse manager
ii. greenskeeper
jj. groundskeeper and gardener
kk. inspector or grader
ll. interior plantscaper
mm. landscape gardener
nn. landscape nursery worker
oo. landscape worker
pp livestock buyer
qq. log handler
rr. log yard and loading area worker
ss. machinery service center employee
tt. machinery service operator
uu. marine mechanic
vv. mechanic
ww. nursery salesperson
xx. nursery worker
yy park ranger
zz. parts person
aaa. photographer
aaa. plant scientist
bbb. poultry production manager
ccc. products buyer
ddd. recreation guide
eee. recreation leader
fff. seed processor
hhh. self-sufficient fisherperson

iii. self-sufficient gatherer
jjj. self-sufficient hunter
kkk. sheet metal worker
lll. small engine repairer
mmm. supplies manager
nnn. surveyor
ooo. tour guide
ppp. tree pruner
qqq. tree service worker
rrr. tree surgeon assistant
sss. tree trimmer
ttt. water and sewage plant operator
uuu. welder

Competency: Prepare a resume and job application

Tasks: List:

a. past and present work experience
b. hobbies and interests
c. community activities or memberships
d. in-school activities or memberships
e. awards, positions, or club offices
f. adult references, including addresses and phone numbers

Explain the importance of:

a. obtaining extra copies of applications
b. reading job applications carefully
c. following instructions
d. completing all items accurately
e. writing legibly
f. using a word processor
g. verifying references before listing them
h. using n/a for items which do not apply

Competency: Write a cover letter

Tasks: Explain when and how to write a cover letter
List the things the cover letter must include
Explain what a writing sample tells a potential employer

Competency: Prepare for an interview

Tasks: Explain how to contact an employer to schedule an interview
Explain how to respond if asked to come for an interview
Describe questions and responses asked in an interview
Explain proper etiquette for an interview
Describe how to dress for an interview

Competency: Follow up the interview

Tasks: Analyze the interview
Determine whether a follow-up letter or call is required
Explain how to write a thank-you note or make a follow-up call

Competency: Understand employee rights and responsibilities

Tasks: Explain state labor laws relating to compensation
Complete tax forms

Describe:

a. minimum wage and types of exempt businesses
b. employee benefits, rights and responsibilities
c. labor contracts, grievance procedures and the role of unions

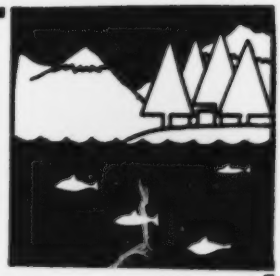
Describe a sample personnel policy

Competency: **Identify proper job resignation procedures**

Tasks: Describe how to:

a. Write a letter of resignation
b. Conduct an exit interview
c. Write a letter of recommendation
d. Request advance notice
e. Make final settlements (e.g. retirement, physical injury, social security, severance pay, etc.)

Introduction to Natural Resources



I. What studying natural resources can and cannot do for you.

Competency: **Recognize employment opportunities in natural resources**

Tasks: Identify employment opportunities and requirements for:

a. land, air, and water
b. conservation and regulation
c. fishing and fisheries
d. forestry, production, and processing
e. outdoor recreation
f. self-sufficiency
g. wildlife

Identify work in shipping and packaging of renewable natural resources, including:

a. work as a longshoreperson
b. work for the Alaska Railroad
c. work in trucking
d. work on barges

II. An overview of natural resources.

Competency: **Define terms related to natural resources**

Tasks: Identify natural resources terms including:

a. conservation
b. development
c. human resource
d. multiple use planning
e. non-renewable
f. non-sustainable yield
g. reclamation
h. renewable
i. sustained yield
j. capital resource
k. natural resource
l. preservation
m. exploitation
n. carrying capacity
o. potential resources

Competency: **Define the major world natural spheres**

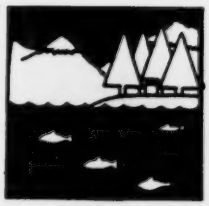
Tasks: Identify:

a. atmosphere
b. biosphere
c. hydrosphere
d. lithosphere

Competency: **Define major forces in the physical environment**

Tasks: Describe:

a. hydrologic cycle
b. carbon-oxygen cycle
c. various biogeochemical cycles



Competency: **Define important systems in the living environment**

Tasks:
Explain ecology and ecosystem
Explain:
a. the pyramid of life
b. the predator food web
c. the parasitic food web
d. the saprophytic food web
e. energy transfer and trophic levels in the ecosystem

Competency: **Identify the role of water resources in natural systems**

Tasks:
Identify the role of:
a. the sea on natural systems
b. water in the atmosphere (humidity) on natural systems
c. ground water in natural systems
d. polar ice on natural systems
e. surface water on natural systems
f. precipitation levels and water movement on natural systems
g. glaciers on natural systems
h. the hydrologic cycle in natural systems
i. water conservation on natural systems
Explain how to take inventory of the state's water supply
Explain and define watershed

Competency: **Define ecological systems in streams, lakes, bays, and inlets**

Tasks:
Identify the chemical properties of water
Identify the physical properties of water
Trace the stages in lake succession
Explain biochemical oxygen demand
Explain dissolved oxygen levels
Classify lakes by oxygen type
Identify the structure and zones of streams, lakes, bays and inlets
Explain seasonal changes in streams, lakes, bays and inlets
Sample streams, lakes, bays and/or inlets for dissolved oxygen level

Competency: **Apply ecological principles**

Tasks:
Explain the role of the modern ecologist
Identify sciences dealing with taxonomic divisions of biology including:
a. bacteriology
b. botany
c. entomology
d. ichthyology
e. mycology
f. ornithology
g. phytcology
h. protozoology
i. zoology

Identify sciences dealing with life functions including:
a. ecology
b. embryology
c. genetics
d. morphology
e. physiology

Use applied ecology (i.e. in forest management, watershed management, range management, etc.)

Competency: **Define the role of plant and animal succession in the natural world**

Tasks:
Identify factors directing plant and animal succession
Identify the stages in succession from migration to stabilization
Explain a succession cycle such as:
a. marsh to meadow succession
b. bare soil to climax grass and shrubs
c. bare soil to climax forest succession

Competency: **Define important communities in the natural world**

Tasks:
Differentiate among types of communities, biomes and the ecosystem
Identify important relationships between species
Identify important relationships within a species
Differentiate among food producers and consumers
Explain effects of seasonal and other changes on living communities

Competency: **List Alaska's economically important natural resources**

Tasks:
Identify Alaska's economically important renewable natural resources
Identify Alaska's economically important non-renewable natural resources

III. History and ethics.

Competency: **Understand the pre-contact human interaction with natural resources**
(pre-contact meaning before Native and Western cultures came into contact)

Tasks:
Identify the theory of the Bering land bridge immigration of Native people to North America
Identify effects of pre-contact Natives on natural resources
Compare pre-contact interactions with natural resources with post-contact interactions

Competency: **Understand pre-contact human ethics related to natural resources**

Tasks:
Identify historic Native Alaskan ethics regarding use of natural resources
Identify the probable impact of pre-contact societies

Competency: **Understand expansion-era human ethics related to natural resources**

Tasks:
Explain environmentally consequential events such as decimation of the buffalo and fur seal
Identify historic Western European/American ethics regarding use of natural resources
Explain economic motivations of Russian expansion to Alaska
Identify impacts of the Russian fur trade on Alaskan resources

Competency: **Understand Russian-era human ethics related to natural resources in Alaska**

Tasks:
Identify the impact of the fur trade on Russian involvement in Alaska
Explain the likely Russian attitude towards endemic peoples
Explain the likely Russian attitude towards natural resources

Competency: **Understand the human interaction with natural resources in Alaska from Alaska purchase to statehood**

Tasks:
Trace the goldrushes:
- a. Klondike
- b. Nome
- c. Fairbanks

Identify types of federal and state-protected and managed areas:
- a. National Forest
- b. National Monument
- c. National Wildlife Refuge
- d. historic area
- e. recreation area
- f. wilderness area
- g. state park
- h. state forest

Describe the motivation behind early federally-protected and managed areas including:
- a. Chugach National Forest
- b. Glacier Bay National Monument
- c. Katmai National Monument
- d. Denali National Park
- e. National Petroleum Reserve
- f. Tongass National Forest

Competency: **Understand human ethics related to natural resources in Alaska from purchase to statehood**

Tasks:
Identify the role of natural resources in the Alaska purchase
Describe the natural resources ethics involved in the goldrush
Describe motivations in quest of natural resources (if any) of the Japanese occupation of Alaska during World War II
Describe the role of Alaska humans in resource management prior to statehood
Compare historic Russian and U.S. attitudes towards natural resources in Alaska

Competency: **Understand human interaction with natural resources in Alaska from statehood to present**

Tasks:
Understand issues related to the construction of the Alaska pipeline
Trace issues involved with the 1978 use of the Antiquities Act in declaring new national monuments in Alaska
Trace the importance of the National Environmental Policy Act (NEPA)
Label portions of Alaska managed by:
- a. federal government (BLM)
- b. state government
- c. native corporations
- d. private individuals

Identify the role of agencies such as the Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, the US Environmental Protection Agency and others related to:
- a. air quality
- b. coastal management
- c. drinking water
- d. environmental impact statement
- e. fish and wildlife habitat protection
- f. grants to communities
- g. hazardous wastes
- h. lands management plans
- i. litter and recycling
- j. oil pollution control
- k. pesticides
- l. sanitation
- m. seafood/meat-USDA inspection
- n. sewage treatment and disposal
- o. wetlands protection

Describe the land management and natural resources development and preservation role of Alaska Native corporations

Competency: Understand human ethics related to natural resources in Alaska from statehood to present

Tasks:
Describe how regulations are made and by whom
Identify goals of public land policy
Explain how the availability of work affects interactions with natural resources in communities
Describe the social changes in Alaska which are likely to result from further development in Alaska (economic, political and cultural)
Explain how the introduction of aircraft, high-powered rifles and ATV's has affected Alaskan natural resources
Describe the natural resource impacts of highways, pipelines, and seaports on natural resources in Alaska
Describe the issues of development versus conservation of wild areas in Alaska
Describe how a village or town changes with the introduction of telephone and television

Competency: Understand the role of humans in resource issues

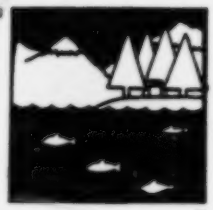
Tasks:
Describe the effects of overpopulation on natural resources
Identify factors capable of changing population numbers such as:
- a. mortality
- b. fertility rates
- c behavior changes (attitudes, birth control, etc)

Explain the effects of humans on natural resources, including:
- a. water use/pollution
- b. air quality
- c. noise control and pollution
- d. soil conservation
- e. food and fiber production systems
- f. industrial pollution
- g. chemical use and pollution
- h. energy use (nuclear, fossil, natural)
- i. tyranny of geography (unequal distribution of natural resources)
- j. fish and wildlife habitat

Discuss differing approaches to natural resource management
Explain ecological and economical points of view in terms of natural resource development
Examine ecological studies

Competency: Understand the management of public lands

Tasks:
Describe the acquisition of public resources
Explain how federal lands are converted to state or private ownership
Contrast several public and private attitudes towards use of public land
Identify trends in the public attitude towards use of public lands
Identify legal uses of federal lands, according to type of federal land
Discuss the "tragedy of the commons"--problems with public land management
Describe the role of other various federal, state, and private, and non-profit agencies dealing with land management and resources issues including:
- a. Agricultural Experiment Station
- b. Agricultural Extension Service
- c. Agricultural Stab. and Conserv. Svc.
- d. Alaska Center for the Environment
- e. Alaska Environmental Lobby
- f. Alaska Loggers Association
- g. Alaska Miner's Association
- h. Coastal Zoning Commission
- i. Fed Water Poll Cntrl Admin.
- j. Greenpeace
- k. Land-grant University
- l. Nat. Audubon Society
- m. Nat. Marine Fisheries
- n. Nat. Oceanographic and Atmsph. Admin.
- o. Nat. Park Association
- p. Nat. Park Service



q. Agricultural Experiment Station
r. Agricultural Extension Service
s. Agricultural Stab. and Conserv. Svc.
t. Alaska Center for the Environment
u. Alaska Environmental Lobby
v. Alaska Loggers Association
w. Alaska Miner's Association
x. Coastal Zoning Commission
y. Alaska Women in Mining
z. Alaska Women in Timber
aa. Audubon Society--local chapters
bb. Bureau of Land Management
cc. Bureau of Outdoor Recreation
dd. Bureau of Sport Fish and Wldlfe
ee. AK Div of Fish and Wldlfe Prot.
ff. Fed Water Poll Cntrl Admin.
gg. Greenpeace
hh. Land-grant University
ii. Nat. Audubon Society
jj. Nat. Marine Fisheries
kk. Nat. Ocean & Atmsph Adm.
ll. Nat. Park Association
mm. Nat. Park Service
nn. The Sierra Club
oo. Trustees for Alaska
pp. U.S. Fish and Wildlife Service
qq. U.S. Forest Service
rr. Water Pollution Control Fed.
ss. Water Resources Council
tt. Wilderness Society

Competency: Contrast rural and urban relationships

Tasks:
Contrast rural and urban educational levels
Contrast available recreation in rural and urban areas
Contrast rural and urban cultures
Contrast rural and urban economies
Contrast population growth in rural and urban areas in Alaska

Competency: Understand the importance of planning in proper resource management

Tasks:
Identify people's wants regarding natural resource use
Describe how people put monetary values on resources
Identify governmental and other incentives promoting conservation
Identify conditions under which land plans are required

Competency: Understand principles of conservation

Tasks:
Explain conservation (wise resource use)
Identify terms related to conservation of renewable and non-renewable natural resources including:

a. carnivore, omnivore, herbivore
b. ecology and ecosystem
c. population, community, niche
d. environment and habitat
e. erosion (wind and water)
f. reclamation
g. recycling
h. food cycle/chain/web
i. carrying capacity, sustained yield, multiple use

Describe man's use and abuse of natural resources
Classify important Alaskan renewable natural resources
Identify the goals of conservation

Competency: Understand the conservation movement in the U.S.

Tasks:
Briefly outline the history of the U.S. conservation movement
Identify important persons in the history of the U.S. conservation movement
Identify conflicting points of views in the U.S. conservation movement
Identify points of view that resolve conflicts, i.e., use of measures that mitigate resource conflicts

Explain historical events which led to the conservation movement including:

a. large fires in the Northwest and Great Lake states in the 1800's and early 1900's
b. the death of the buffalo and the rise of large horse, cattle, and sheep ranches
c. overgrazing and ensuing conflicts (range wars)
d. drought
e. societal introspection and counter-materialism in the 1960's
f. world population pressures
g. highly efficient/mechanized food and fiber production

Identify early leaders in the conservation movement including:

a. Aldo Leopold
b. Theodore Roosevelt
c. John Muir
d. Gifford Pinchot
e. Emerson
f. Thoreau

Competency: Understand major social and economic factors concerning conservation

Tasks:
Describe the economic impact of air, water and soil pollution
Describe the economic and societal costs of conservation measures
Describe possible reasons for resistance to conservation
Describe competitive advantages or disadvantages brought about by conservation measures

Competency: Understand human effects on streams and lakes

Tasks:
Identify long-term effects of construction on flood-plains
Describe the effects of damming streams for power or flood control
Describe the effects of altering stream channels
Describe the effects of human pollution on lakes and streams
Explain the impact of placing of realistic economic values on water usage
Explain the impacts of thermal pollution (air and water)
Explain the impacts of conservation on the ecosystems of which humans are a part

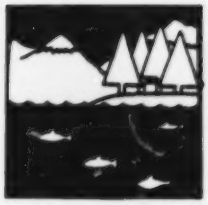
Competency: Understand technological impacts of highways

Tasks:
Describe the loss of farm lands to highways
Describe how a highway can impact an area
Explain changes in human interactions when remote areas become accessible by road
Explain possible changes in wildlife populations when areas become accessible by road

Competency: Understand how to control hazardous wastes

Tasks:
Identify types of hazardous wastes
Explain ways to minimize production of hazardous wastes
Explain possible effects of improper disposal of hazardous wastes
Name possible safe ways to transport and dispose of hazardous wastes

IV. Laws, economics, and land ownership.



Competency: **Understand laws related to Alaska's natural resources**

Tasks:
Explain the purpose of public law in natural resource management
Trace development of a law from concept to acceptance
Identify laws related to placer mining runoff water quality
Identify laws related to logging in the national forests
Identify laws related to resource development in national parks, national monuments, and national wildlife refuges

Competency: **Understand issues related to land ownership and management**

Tasks:
Identify the land ownership role of the Alaska Statehood Act
Identify the importance of ANCSA/1991 to Native land ownership in Alaska
Identify the importance of ANILCA to land ownership in Alaska
Examine the role of the following agencies in land management in Alaska:

a. BLM
b. U.S. Forest Service
c. National Park Service
d. Department of Nat. Resources
e. village corporations
f. regional corporations
g. U.S. Fish and Wildlife Service

Competency: **Understand economics related to natural resources**

Tasks:
Identify annual gross receipts of all important Alaskan natural resource industries
Contrast renewable with non-renewable natural resource industries
Identify trends in Alaska's natural resource industries

a. agriculture
b. forestry
c. horticulture
d. fisheries
e. wildlife
f. land protection

Agricultural Mechanics

(A) Denotes more advanced competency or task.

Agricultural Mechanics I:

Competency: Maintain shop safety

Tasks:
Wear personal safety equipment and clothing for the task to be performed
Keep the work area free of clutter, flammable materials and other potential hazards
Operate field machinery and equipment according to recommendations in the operator's manual
Use tools, machinery and materials for their intended purpose
Follow all recommended safety precautions

Competency: Use hand tools

Tasks:
Demonstrate the safe use of hand tools
Maintain hand tools in an efficient and safe manner
Identify and use or describe the use of the following hand tools:

a. hack saw
b. crosscut saw
c. rip saw
d. combination square
e. level
f. socket wrenches
g. open wrenches
h. pliers
i. claw hammer
j. nail punch
k. flat head screwdrivers
l. phillips head screwdrivers
m. measuring tools

Competency: Use power tools

Tasks:
Demonstrate the safe use of power tools
Maintain tools in an efficient and safe working condition
Identify and use or describe the use of the following power tools:

a. band saw
b. circular saw
c. impact wrench
d. metal cutting bandsaw
e. planer
f. portable drill
g. portable grinder
h. power hacksaw
i. power nailer
j. radial arm saw
k. stationary drill press
l. stationary grinder
m. table saw

Identify and describe the use of power tools used in maintaining and repairing equipment

Competency: Use ropes effectively

Tasks:
Make a halter
Tie the following knots and identify situations appropriate for their use:

a. square knot
b. clove hitch
c. bowline
d. trucker's hitch

Complete the following splices and identify situations appropriate for their use:

a. long splice
b. end splice
c. round splice

Competency: Perform basic drafting procedures

Tasks:
Follow drafting safety procedures
Care for, store, and protect drafting equipment
Use drafting tools, including:

a. protractors
b. triangles
c. french curves
d. templates
e. erasing shields
f. erasers
g. drafting pencil
h. t-squares
i. drafting boards
j. drafting tables

Make letter and title blocks correctly
Measure and scale drawings
Perfect standard orthographic drawing techniques
Produce drawings
Draw architectural plans for a small structure
Identify occupations which require drafting skills
Complete drafting plans for a metal or woodworking project
(A) Use a Computer-Aided Drafting (CAD) system

Agricultural Mechanics II:

Competency: Use service and repair manuals

Tasks:
Read and follow directions given in service and/or repair manuals
Locate in service/repair manuals information needed to complete specific tasks
Complete the assigned maintenance or service tasks according to manufacturers' recommendations

Competency: Order parts, supplies, equipment, and services

Tasks:
Describe how to use engine manuals and parts lists
Locate information in engine manuals such as:

a. engine specifications
b. repair procedures
c. part numbers, prices, and sources

Perform engine repair operations by following repair manual instructions
Calculate prices from parts lists and shipping cost specifications

Competency: Maintain maintenance and service records

Tasks:
Determine fuel, lubricant, and supply needs
Keep equipment and parts catalogs updated
Order spare parts and equipment from catalogs using model and parts numbers
Maintain a current file of repair and service companies
Determine equipment and tool needs
Keep equipment repair manuals updated

Competency: **Operate an agricultural wheel-type tractor**

Tasks:
Perform daily pre-operational check
Start, operate and stop a tractor safely
Safely operate a tractor on the highway
Safely transport tractor

Competency: **Maintain and service lubrication system**

Tasks:
Explain engine lubrication systems terms, principles, and components and their function
Describe the role of lubrication
Explain lubrication system diagnosis/repair terms, principles, and methods
Describe the effects of lubrication system failures
Contrast several lubrication systems
Contrast the properties of common lubricating engine oils
Identify and contrast the applications of bearing types including:
a. ball bearings
b. roller bearings
c. needle bearings
d. babbit or bushing bearings
e. thrust washers or bearings
Troubleshoot bearing and lubrication failures

Competency: **Arc weld**

Tasks:
Practice welding safety practices
Set up welder
Complete welds in the flat position

Competency: **Oxy-acetylene cut and weld**

Tasks:
Practice welding safety practices
Set up oxy-acetylene unit
Start and shut down unit
Complete basic welds in flat position

Agricultural Mechanics III:

Competency: **Perform general shop tasks**

Tasks:
Adjust or remove and replace seals and bearings
Check tires for pressure, wear and defects
Demount, repair, replace large and small tubes and tires
Complete work orders, service invoices and requisitions
Prepare written cost estimate of repair work and a warranty claim
Clean machinery and equipment with a steam cleaner
Paint tractors, machinery and equipment
Winterize equipment

Competency: Perform basic wiring

Tasks:
- Apply fundamentals of electricity
- Make an extension cord
- Wire a switch
- Complete various electrical splices

Competency: Perform more advanced arc welds

Tasks:
- Follow welding safety practices
- Perform basic arc welds
- Weld vertically
- Weld horizontally
- Perform hand surfacing
- Weld pipe

Competency: Mig weld

Tasks:
- Follow welding safety practices
- Set up machine
- Run through Mig welder operation
- Complete Mig welds

Competency: Tig weld

Tasks:
- Follow welding safety practices
- Run through Tig welder operation
- Complete Tig welds
- Weld aluminum

Competency: Operate and service small motors

Tasks:
- Identify appropriate motors for given situations based on:
  - a. size
  - b. enclosure
  - c. starting load
  - d. operating load
  - e. RPM
  - f. type of mount
  - g. drive system
  - h. control and protection devices
- Change the voltage used to operate a motor
- Change the direction of rotation of a motor
- Install a motor correctly for a specific task
- Check, clean and lubricate a motor
- Read and follow the operating and maintenance instruction in the operator's manual for motors

Competency: Operate and service small gasoline engines

Tasks:
- Choose the right engine for the job
- Troubleshoot engine failure
- Recommend parts needed for engine repair
- Lubricate all parts of the engine as specified in the operator's manual
- Remove, service, replace the breather
- Adjust for correct RPM
- Make minor repairs necessary to continue operation

Check, change and gap spark plugs
Check, replace points, condenser and coil
Mix fuel, refuel small gasoline engines
Correctly operate small gasoline engines for different tasks
Maintain a roto tiller

Competency: **Operate an agricultural wheel-type tractor under field conditions**

Tasks:
Operate a tractor under field conditions
Make remote hydraulic cylinder connections
Connect PTO shaft from allied equipment
Connect 3-point implements
Follow recommended maintenance schedules
Safely handle fuels and refuel tractor
Hitch and unhitch tractor implements using recommended procedures and safety

Competency: **Identify equipment requirements**

Tasks:
Determine equipment replacement schedule
Identify equipment to sell or eliminate from inventory
Project need for new or updated equipment
Estimate cost to purchase, operate and maintain new equipment
Compare cost, efficiency and maintenance requirements of various models and makes of equipment
Prepare bid specification for purchase of equipment and services

Competency: **Operate agricultural field equipment**

Tasks:
Set up and operate planting equipment
Adjust and operate cultivating equipment
Harvest crops with mechanical harvesting equipment
Operate and adjust tillage equipment
Calibrate and operate crop spraying equipment

Competency: **Adjust and repair agricultural equipment**

Tasks:
Identify types, parts and accessories of major items of agricultural equipment used in the local area, from the following list:

a. land preparation equipment
b. planting equipment
c. tillage equipment
d. fertilization equipment
e. harvesting equipment
f. weed, insect and pest control equip.
g. irrigation equipment
h. general usage farm equipment

Assemble the items of equipment used
Adjust items of equipment used
Determine which item of equipment and which accessories to use
Prepare items of equipment used for hitching to a tractor (where applicable)
Replace damaged or worn parts of items of equipment used
Service, lubricate items of equipment used
Follow all operating and safety instructions and operate the items of equipment

Competency: **Maintain and service fuel system**

Tasks:
- Adjust carburetor for load and idle operation
- Repair or replace carburetor
- Maintain a clean supply of gasoline and diesel fuel
- Replace fuel filters
- Adjust governor on equipment
- Troubleshoot diesel injection fuel system problems
- Troubleshoot carburetor fuel system problems

Competency: **Maintain and service brake systems**

Tasks:
- Explain braking system terms, principles, and components and their functions
- Compare the construction, operation, and servicing of drum and disk brakes
- Remove and replace disc brake rotor
- Remove and replace brake shoes
- Check and service fluid level
- Inspect brake hoses and lines
- Rebuild wheel cylinder
- Remove and replace caliper assembly
- Bleed brake system

Competency: **Troubleshoot gas and diesel power units**

Tasks:
- Troubleshoot components of the engine, using recommended testing equipment
- Service, adjust engine for proper operations

Competency: **Maintain and service the ignition system**

Tasks: Service and test/adjust/replace:

a. spark plugs and ignition wires
b. spark plug gap
c. spark plug wires
d. distributor rotor, cap and points
e. ignition timing
f. primary circuit resistance
g. ignition coil
h. secondary circuit continuity
i. glow plug electrical system
j. distributor module
k. condenser
l. distributor module (electronic)
m. coil
n. distributor
o. automatic spark advance mechanism
p. glow plug
q. automatic spark advance mechanism
r. ignition system using engine analyzer
s. worn distributor parts
t. pickup coil (electronic)
u. distributor

Agricultural Mechanics IV:

Competency: **Service manual transmissions and differentials**

Tasks:
- Explain transmission terms, fundamental principles, components and their functions
- Explain clutch terms, fundamental principles, components and their functions
- Explain differential terms, fundamental principles, components and their functions
- Use special tools and equipment
- Use service and repair manuals

Service and adjust/replace:

a. clutch assembly
b. linkage
c. transmission/transfer case
d. driveline, universal joints, and constant velocity universal joints
e. differential
f. lubricant levels and condition

(A) Overhaul/rebuild:

a. manual transmissions
b. transfer cases
c. differentials

Competency: Maintain and service clutches

Tasks:

Adjust manual clutch
Check clutch cable
Adjust hydraulic clutch free travel
Service:

a. clutch release bearing
b. clutch cable
c. clutch release fork
d. hydraulic clutch slave cylinder

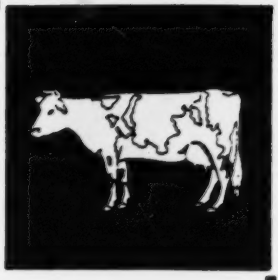
Rebuild hydraulic clutch slave cylinder
Rebuild hydraulic clutch master cylinder

Competency: Maintain and service electrical system accessories

Tasks:

Clean, tighten and treat battery terminal connection
Charge batteries
Measure the specific gravity and voltage of a battery
Run a load test on a battery
Troubleshoot the electrical system, using recommended testing equipment
Replace parts of electrical system components
Adjust or set all parts of system for proper operation

Animal Science



Animal Science I:

Competency: **Understand principles and terms related to animal science**

Tasks: Identify terms related to animal science including:

a.	artery	x.	dehorn	uu.	ram
b.	barren	y.	doe	vv.	ration
c.	bitch	z.	estrus	ww.	registered
d.	boar	aa.	eviscerate	xx.	rooster
e.	breeder	bb.	excrement	yy.	roughage
f.	broiler	cc.	exotic	zz.	ruminant
g.	buck	dd.	fetus	aaa.	runt
h.	bull	ee.	gestation	bbb.	seed stock
i.	butter	ff.	gosling	ccc.	shoat
j.	calf	gg.	grade	ddd.	show stock
k.	calves	hh.	hatchery	eee.	slaughter
l.	calving	ii.	heat	fff.	sow
m.	capon	jj.	milker	ggg.	sow
n.	carcass	kk.	molt	hhh.	species
o.	carnivorous	ll.	molt	iii.	stag
p.	castrate	mm.	mutation	jjj.	steer
q.	castration	nn.	parasite	kkk.	strain
r.	chew cud	oo.	pedigree	lll.	stud
s.	chromosome	pp.	pelt	mmm.	trait
t.	cooperative	qq.	poultry	nnn.	type
u.	crossbreeding	rr.	prey	ooo.	veal
v.	cull	ss.	protein	ppp.	virus
w.	decomposition	tt.	purebred		

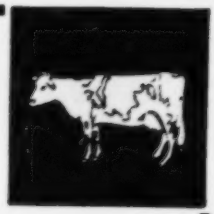
Competency: **Select animals**

Tasks:
Identify major parts of animal anatomy
Identify breeds of commercial animals
Evaluate desirable conformation characteristics of animals
List desirable characteristics of breeding animals
Determine method of selection (judging)
Identify wholesale cuts
Explain reasons for selection
Administer general first aid to animals
Restrain and handle animals/safety
Market animals

Animal Science II:

Competency: **Understand animal health principles and common diseases**

Tasks:
Identify health principles and common diseases of animals
Identify disorders associated with feeding (bloat, colic, mold)
Identify symptoms of stress in animals
Control insects, diseases and parasites



Treat common animal diseases and disorders
Identify infestations of animal internal and external parasites
Treat animals for internal and external parasites
Develop and manage a schedule of preventive medication
Clean and disinfect trailers, pens, and other animal holding equipment
Identify and follow regulations regarding the use of pesticides and medications on breeding and slaughter animals
Read and follow directions on pesticide labels and medication containers
Restrain animals
Castrate animals

Competency: **Feed animals**

Tasks:
Prepare a feeding schedule
Categorize major animal food groups and explain function
Identify feeds
Determine nutritional requirements of animals
Distinguish between ruminants and non-ruminants
Determine nutritional value of feedstuffs
Maintain a fresh, clean water supply for animals
Mix feed and feed animals
Balance a feed ration
Store feed
Calculate cost of gain per pound for different feed rations

Animal Science III & IV:

Competency: **Manage animals**

Tasks:
Select appropriate animal enterprise, considering:
a. breed
b. scope
c. market strategy
Compare breeding methods
Care for newborn animals
Manage grazing animals on the range
Identify ecological impacts of grazing animals
Manage forage on the range
Maintain animal health
Maintain production, personnel and business records, including:
a. budget
b. business agreement
c. journal of monthly expenditures and income, outlays for labor etc.
d. inventory
e. cash flow
Analyze contracts, leases and other legal documents
Construct, repair and maintain facilities and equipment
Exhibit and market animals

Plant Science

Plant structure, function, growth, and reproduction

Competency: Recognize basic parts of plants and their functions

Tasks: Identify meanings for plant-related terminology including:

a. adhesion
b. aerobic
c. angiosperm
d. annual
e. asexual reproduction
f. biennial
g. blade
h. broadcast
i. bud
j. bulb
k. calcium
l. carbohydrates
m. cell
n. cellulose
o. cereal
p. compound
q. crown
r. cuticle
s. diffusion
t. embryo
u. enzyme
v. erosion
w. evaporation
x. fats
y. fermentation
z. fibrous
aa. filament
bb. fruit
cc. fungi
dd. fungicide
ee. genus
ff. germination
gg. glucose
hh. layering
ii. mutation
jj. natural selection
kk. necrosis
ll. nectar
mm. oxidation
nn. oxygen
oo. parasite
pp. petioles
qq. phloem
rr. phosphorus
ss. photosynthesis
tt. pollination
uu. respiration
vv. rhizome
ww. rhizomes
xx. scion
yy. sexual reproduction
zz. starch
aaa. stolons
bbb. sugar
ccc. sulfur
ddd. tap roots
eee. taproot
fff. tissue
ggg. transpiration
hhh. urea
iii. variety
jjj. virus
kkk. xylem

Identify the role of flowers and fruits in plant reproduction
Identify basic plant parts and processes, including:

a. bract
b. cambium
c. chlorophyll
d. dicot
e. epidermis
f. phloem
g. photosynthesis
h. pistil
i. respiration
j. stamen
k. transpiration
l. xylem

Competency: Recognize plants by growth habits

Tasks: Identify growth habits of leaves including:

a. compound leaves
b. simple leaves
c. leaf blades
d. leaf petioles

Identify growth habits of roots including:

a. tap roots
b. fibrous roots

Identify growth habits of plant stems, flowers and fruits
Identify methods of plant reproduction

Plant Taxonomy

Competency: **Use plant keys**

Tasks:
- Use botanical nomenclature and classification
- Differentiate among alternate, opposite and whorled leaf arrangements
- Differentiate among parallel, pinnate, and palmate venation
- Identify plants by flowers
- Differentiate among annual, biennial, and perennial plants

Competency: **Classify plants**

Tasks:
- Identify the system of plant taxonomy including the levels of classification:
  - a. kingdom
  - b. division
  - c. class
  - d. subclass
  - e. order
  - f. family
  - g. genus
  - h. species
  - i. cultivar
- Identify common Alaskan edible and poisonous plants
- Classify various agronomic and horticultural plants
- Explain U.S. government grades for agricultural products

Plant Environment

Competency: **Understand the nature and properties of soils**

Tasks:
- Identify the importance of soil to living things
- Describe major characteristics of soil, including:
  - a. texture
  - b. structure
  - c. pH
  - d. fertility
  - e. cation exchange capacity (CEC)
  - f. productivity
- Identify the role of soil organisms
- Identify the role of soil atmosphere
- Identify ways that soil is modified for plant growth, including the use of:
  - a. soil mixtures
  - b. soil mulches
  - c. soil-less media
- Analyze soil
- Explain the role of fertilizer for plants
- Identify the role of soil moisture

Competency: **Understand influence of moisture, light, temperature, and air**

Tasks:
- Explain plant absorption of water
- Explain the role of light quantity, quality, and duration in plant growth and reproduction
- Explain the role of temperature on plant growth and reproduction

Competency: **Understand how to control plant growth**

Tasks:
- Explain ways to control plant growth, including:
  - a. pruning
  - b. thinning
  - c. chemical application (growth retardants, etc.)

Explain reasons for controlling plant growth including:

a. economic
b. aesthetic
c. special effects
d. research

Identify techniques and purposes of pruning and thinning
Identify techniques and purposes of disbudding and pinching
Identify ways and purposes of controlling temperature for plant growth
Identify ways and purposes of chemical control of plant growth

Plant Health

Competency: Understand characteristics of a healthy plant

Tasks:

Point out healthy plant characteristics such as:

a. erectness
b. healthy leaves
c. plant size
d. plant odor
e. plant wounds
f. color or general appearance

Identify characteristics of plant disorders
Examine plants for good health
Explain ways to cultivate healthy plants

Competency: Understand environmental factors causing plant disorder

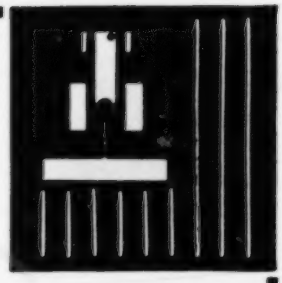
Tasks:

Identify the importance of appropriate plant moisture
Explain the perils of over watering and under watering
Identify when to water and ways to water plants
Identify the importance of maintaining proper :

a. relative humidity
b. light conditions
c. temperature

Identify primary plant nutrients
Explain the role of chemicals in plant growth
Identify mechanical and cultural plant disorders
Map out a plant management plan

Soil Science/Agronomy



Soil Science/Agronomy I:

Competency: **Understand the function of soils**

Tasks: Identify terms related to soil, including:

a.	aeration	l.	infiltration	w.	silt
b.	aggregate	m.	inorganic	x.	slope
c.	cation exchange capacity	n.	loam	y.	soil profile
d.	clay	o.	loess	z.	soil structure
e.	contour	p.	nature of soil	aa.	solum
f.	drainage	q.	organic	bb.	subsoil
g.	erosion	r.	permeability	cc.	terrace
h.	fertility	s.	productivity	dd.	texture
i.	fertilizer	t.	properties of soil	ee.	tilth
j.	hardpan	u.	runoff	ff.	topography
k.	impervious soil	v.	sand	gg.	true soil

Identify the components of soil including:

a. soil atmosphere
b. soil moisture
c. parent material
d. soil organisms

Explain how soil is formed
Identify the importance of soil
Describe primary soil microrganisms
Describe the water-holding capacity of soil
Describe the role of soil organic matter
List soil texture groups
Describe how soils are classified
Identify types of soil by color, structure, texture and soil profile analysis

Soil Science/Agronomy II:

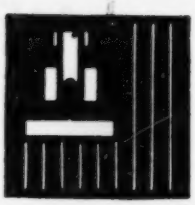
Competency: **Understand physical and chemical properties of soil**

Tasks: Identify chemical components of soil
Explain effect of plant nutrients, nitrogen, phosphorus, and potassium on growth
Explain the significance of soil organisms to growth
Analyze soil conditions, including:

a. soil acidity
b. pH
c. phosphorus
d. potassium
e. nitrogen
f. depth of bedrock
g. slide potential
h. organic content
i. degree of erosion

Interpret analysis of soil samples
Interpret basic soil differences
Make borings and vegetative studies of wet areas
Interpret results of soil test
Prescribe fertilizer based on test results and cultural practices
Calculate cost per pound of various fertilizers

Soil Science/Agronomy III:



Competency: Understand properties of the soil profile

Tasks:
- Measure available water holding capacity
- Measure water intake rate
- Measure effective soil depth
- Identify classifications of salt and sodium content of soil

Competency: Understand land capability

Tasks:
- Determine type of crop and proper management
- Determine range use and capability
- Explain urban land uses
- Determine the best use of lands including:
  a. appraising land
  b. evaluating income potential
  c. identifying government policies and regulations
  d. land capability classification

Competency: Use soil surveys

Tasks:
- Obtain local soil survey
- Identify uses of land according to soil
- Develop a conservation plan

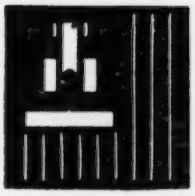
Competency: Utilize land descriptions

Tasks:
- Define:
  a. acre
  b. section
  c. acreage
- Pace off land
- Determine acreage
- Read land descriptions
- Complete a land description
- Measure and record land topography
- Describe the Land Capability Classification System
- Survey land: *For competencies and tasks in surveying see "Land, Air, and Water," and "Forestry" sections.*

Soil Science/Agronomy IV:

Competency: Use soil conservation and management techniques

Tasks:
- Explain the effects of wind , water, and temperature on soil
- Identify the system of land capability classification including capability classes and subclasses



Competency: **Test soil**

Tasks: Identify terms related to soil testing, including:

a. nature of soil
b. properties of soil
c. parent material
d. topography
e. solum
f. true soil
g. aeration
h. organic
i. inorganic
j. tilth
k. permeability
l. soil structure
m. aggregate

Identify the composition of soil including using color, structure and texture
Take soil sample
Collect test pit information for building purposes
Interpret basic soil differences
Make borings and vegetative studies of wet areas
Analyze soil, including items as:

a. soil acidity
b. pH
c. phosphorus
d. potassium
e. nitrogen
f. depth of bedrock
g. slide potential
h. organic content
i. degree of erosion

Interpret analysis of soil samples

Horticulture

(A) Denotes more advanced competency or task.

Ornamental Horticulture

Competency: **Understand terms and definitions related to ornamental horticulture**

Tasks: Define terms related to ornamental horticulture including:

a. agronomy
b. botany
c. budding
d. bulbs
e. chlorophyll
f. chloroplast
g. cold frames
h. conditioning
i. corms
j. cutting
k. enzymes
l. epidermis
m. fungi
p. horticulture
q. layering
r. leaf cuttings
s. nodes
t. ornamentals
u. pesticide
v. photosynthesis
n. fungicide
o. herbicide
w. pollen
x. primary root
y. propagation
z. prune
aa. respiration
bb. rhizomes
cc. root
dd. stolons
ee. transpiration

Competency: **List types of ornamental horticulture businesses**

Tasks: Identify work in the fields of:

a. interior plantscaping
b. floriculture
   1. commercial greenhouses
   2. retail florists
c. turf management
d. garden centers
e. nurseries

Identify opportunities in the ornamental horticulture business in Alaska

Competency: **Classify, identify and determine the functional uses of ornamental plant materials**

Tasks: Classify plants according to growth habit– temperature, water, light, etc
Classify plants according to taxonomy
Identify plants according to scientific and common name
Identify ornamentals acclimatized to Alaska
Select plant materials for specific use
Differentiate among annuals, biennials, and perennials
Differentiate among annuals, biennials and perennials, for bulbs, corms, roses, and grasses
Recognize the following selection factors for each flower, shrub, tree, and grasses:

a. height
b. leaf color
c. berries or fruit
d. bloom sequence
e. leaf shape

Differentiate between woody and herbaceous plants
Identify indigenous Alaska-specific species appropriate for landscaping

Competency: **Value attractive lawns and turf**

Tasks:
Explain the value of an attractive lawn
Explain the importance of the turf industry to state and local economies
Explain effects of turf grasses on the environment
Explain the role of turf in places such as parks, playgrounds, and golf courses

Competency: **Understand state and federal regulations related to the operation of a horticulture business**

Tasks:
Observe local, state and federal pesticide regulations
Observe nursery site regulations
Observe and interpret marketing restrictions and agreements
Interpret and observe certification, licensing and inspection requirements
Identify agencies, governmental laws, and regulations affecting the horticulture industry
Maintain file of technical information, periodicals and other publications
Determine sources of up-to-date information and services
List societies, organizations, and associations related to horticulture
Observe local, state and federal regulations regarding the movement of plant materials
Observe EPA pesticide use regulations
Observe site regulations and ordinances

Competency: **Prepare a landscape plan**

Tasks:
Complete the landscape design on paper
Select plants for the landscape plan, including:
a. trees
b. shrubs
c. herbaceous plants

Competency: **Understand the role of soil fertility in ornamental horticulture**

Tasks:
Describe physical, chemical, and biological components of soil
Explain effect of plant nutrients, nitrogen, phosphorus, and potassium on plant growth
Take soil samples; interpret analysis

Competency: **Prepare a site for landscaping**

Tasks:
Operate soil preparation equipment:
a. rototiller
b. shredder
Mix in organic and inorganic additives by following prescribed procedures
Prepare and apply soil mulches appropriate to the local area

Competency: **Use specific tools in planting**

Tasks:
Use planting and transplanting tools including:
a. shovel
b. hoe
c. rake
d. hose
e. braker
f. stake
g. wheelbarrow
h. shears

Competency: **Operate and maintain lawn maintenance equipment**

Tasks: Demonstrate the operating and maintenance procedures of:

a. hand or power aerifiers
b. mowing machines
c. turf sprinklers
d. fertilizer spreader
e. seeder
f. chemical applicators

Operate and maintain:

a. mowing machines
b. turf sprinklers
c. hand or power aerifiers
d. pesticide applicators

Competency: **Prepare growing media and seedbeds**

Tasks:
Identify media materials
Use soil conditioner
Mix rooting and growing media according to plant requirements
Sterilize media
Adjust pH level of media
Collect a soil sample from field and potting medium
Apply sanitation practices when handling and storing plant media materials
Identify and describe common soil ammendments
Select and apply appropriate soil ammendments
Use prepared soil mixtures following prescribed procedures
Mix and prepare soil mixtures with specific characteristics for a given application
Identify the water-holding capacity of various soils
Describe and demonstrate techniques for improving water holding capacity
Fill and level benches and pots with media

Competency: **Handle plants upon arrival**

Tasks:
Store plants temporarily
Store plants long-term
Revive weakened plants

Competency: **Plant shrubs and trees**

Tasks:
Use approved planting techniques
Use a shovel
Use a backhoe (if applicable)
Utilize Alaska Native plants as applicable

Competency: Plant and maintain turf

Tasks:
- Explain the importance of sulfur and lime to turf health
- Select turf grass seed, especially cool climate varieties
- Seed or sod a lawn
- Care for new turf grass
- Maintain established lawn

Competency: Maintain landscape site

Tasks:
- Fertilize plants
- Irrigate plants
- Weed site
- Mow site
- Stake and guy plants
- Control diseases and pests
- Prune plants
- Thin plants

Competency: Apply fertilizer

Tasks:
- Collect soil and leaf tissue samples for analysis
- Interpret and evaluate soil and leaf tissue sample analysis
- Interpret information on a fertilizer label
- Describe types and kinds of fertilizer materials
- Prescribe fertilizer based on test results
- Describe methods of distributing fertilizer
- Apply fertilizers in liquid form
- Apply dry fertilizer materials
- Evaluate influences various nutrients have on plant growth
- Identify nutrient deficiency symptoms in growing plants
- Recognize symptoms of fertilizer burn
- Store fertilizers
- Calculate cost per pound of various fertilizers

Competency: Control pests and diseases

Tasks:
- Identify symptoms of pests affecting plants
- identify common plant pests
- Recognize symptoms of plant damage by insects and related pests including:
  - a. aphids
  - b. whiteflies
  - c. scale
  - d. thrips
  - e. spider mites
- Recognize symptoms of plant diseases including:
  - a. bacterial
    1. rotting
    2. wilting
    3. leaf spotting
  - b. fungal
    1. rotting
    2. mildew
    3. leaf spotting
    4. rusts
  - c. viral
    1. mottle
    2. stunt
    3. chlorosis

Identify common plant pests
Classify insects according to feeding habits
Describe life cycle of common plant pests
Identify plant disease symptoms and causal agents
Describe methods of controlling pests (biological, chemical, and cultural)
Interpret information on a pesticide or agricultural chemical label
Use pesticides safely
Dispose of pesticide containers safely
Interpret and use spray compatibility chart
Identify and apply selective and non-selective herbicides
Mix and apply pesticides
Control weeds by chemical and mechanical means
Identify herbicide spray damage
Clean, adjust and calibrate spray equipment
Determine appropriate time to apply agricultural chemicals
Select and identify pesticides according to killing action (stomach, contact, foliar, systemic)
Recognize symptoms of pesticide poisoning and provide first aid
Apply soil fumigants

Competency: Prune ornamentals

Tasks:
Identify methods of pruning plants to achieve desired growth
Identify and select chemical growth regulators
Identify appropriate time to prune plants
Root prune appropriate plants
Prune foliage of plant materials for desired shape and growth

Competency: Irrigate ornamentals

Tasks:
Identify irrigation needs of plants
Identify irrigation equipment appropriate for kind and type of plant
Set up a system to irrigate plants
Irrigate plants

Competency: Handle shipment packing, temporary storage, and unpacking of plants

Tasks:
Unpack crates and boxes
Bunch, pack and wrap plants
Count, assemble and load plants on vehicle

Competency: Harvest and market nursery stock

Tasks:
Dig, ball and burlap small trees of field grown plants
Prepare plants in an attractive display
Maintain a clean and attractive merchandising area
Take telephone orders
Label and merchandise plants
Greet customers
Describe care and use of plants to customers
Use sales catalogs
Maintain knowledge of plant inventory in nursery

Competency: Perform special ornamental management practices

Tasks:
- Identify methods of pruning, shaping and training
- Prune roots
- Prune foliage and nursery plants
- Select appropriate time to prune and train plants
- Train plants for special effects
- Select chemical growth regulators
- Shape hedges
- Protect plants from cold damage
- Prepare plants for cold hardiness

Competency: Irrigate ornamental plants

Tasks:
- Determine irrigation requirements
- Plan irrigation system
- Install irrigation equipment

Competency: Design a lawn maintenance plan

Tasks:
- Plan and carry out a lawn maintenance plan, determining:
  - a. mowing frequency
  - b. mowing height
  - c. watering schedule
  - d. fertilizer types
  - e. frequency of fertilizer application
  - f. frequency of weed control
  - g. needed lawn renovations
- Plan and maintain athletic fields
- Maintain golf courses

Competency: Design and install interior plantscaping

Tasks:
- Determine desired effect and purpose of interiorscape
- Identify plant materials appropriate for interiorscape
- Analyze environmental conditions of site for interiorscape
- Analyze area for plantscape
- Determine desired effect and purpose of plantscape
- Design plantscape plan

Competency: Consider special characteristics of Alaska's climate

Tasks:
- Distinguish between micro and macro climates
- Identify:
  - a. growing-degree days
  - b. frost-free days
  - c. ambient temperature
  - d. soil temperature
- Relate photo period to plant hardiness

Floriculture

Competency: Define terms and principles of floriculture

Tasks:
- Identify terms related to floriculture
- Identify and classify major floral plants
- Identify floriculture ventures in Alaska including:
  - a. retail
  - b. wholesale
  - c. maintenance
  - d. brokerage

Identify types of crops including:

a. bedding plants
b. foliage plants
c. flowering potted plants
d. cut flowers

Identify common floriculture plants, including those endemic
Differentiate among types of floriculture plants
Identify desirable and non-desirable plants in the floriculture industry
Identify floriculture pests

Competency: Plan the floriculture venture

Tasks: Plan:

a. recommended varieties for the locale
b. production scheme
c. water management
d. fertilizing
e. planting schedule
f. harvest schedule
g. storage of product
h. distribution and marketing

Competency: Prepare the growing medium

Tasks: Identify growing media and amendments
Determine appropriate soil medium for specific plants
Pasteurize soil and evaluate chemical and biological effects
Prepare compost
Mix fertilizer into media
Shred or screen media as needed
Prepare seedbed by hand or power methods
Monitor pH and soluble salts

Competency: Propagate plants

Tasks: Propagate plants by asexual means:

a. cutting
b. grafting and budding
c. layering
d. micropropagation (tissue culture)
e. division

Propagate plants sexually (seeds or spores)

Competency: Manage the crop

Tasks: Cultivate plants as necessary
Thin stands as necessary
Water plants
Apply mulches as appropriate to local area
Control pests
Fertilize as recommended for locale and variety
Protect crops from predators
Utilize conservation practices

Competency: **Perform special management practices**

Tasks:
- Pot plants
- Pinch flowering plants
- Disbud flowering plants
- Prune plants
- Train and shape plants
- Apply growth-regulating chemicals
- Use post-harvest preservatives as necessary

Competency: **Use special harvest methods**

Tasks:
- Cut flowers or foliage
- Count, grade and bunch flowers or foliage

Competency: **Design with flowers and foliage**

Tasks:
- Condition cut flowers
- Prepare boutonnieres or corsages
- Prepare cut flower containers
- Construct a line arrangement
- Complete a floral arrangement
- Design a simple floral centerpiece
- Design a Christmas arrangement
- Construct a dish garden or terrarium
- Complete a product display

Competency: **Sell products**

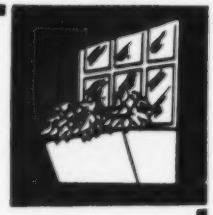
Tasks:
- Greet customers
- Help customers select products
- Take telephone orders
- Operate cash register
- Cash out register

Vegetable and Fruit Production (Olericulture)

Competency: **Define basic olericulture terms and techniques**

Tasks: Identify terms such as:

a. adapted
b. broadcast
c. cold frame
d. compost
e. enzyme
f. fertility
g. flat
h. fungicides
i. furrow
j. hardy
k. harvesting
l. herbicides
m. hotbed
n. implement
o. insecticides
p. irrigation
q. mulch
r. nematode
s. organic matter
t. pasteurization
u. pesticides
v. pH
w. pruning
x. rotation
y. sake
z. seedbed
aa. seedling
bb. shading
cc. site
dd. slope
ee. sterilization
ff. toxic
gg. transplanting
hh. variety
ii. weed



Competency: **Assess the potential for personal use and commercial agriculture**

Tasks:
List crops and varieties grown in local area
Identify markets for locally-grown products
Describe local desirable and undesirable plants
Describe food storage procedures such as using root cellars

Competency: **Plan the operation**

Tasks:
Determine length of growing season
Determine rainfall and air and soil temperature parameters during growing season
Plan crop and variety location
Test soil
Determine vegetable production procedures and recommended varieties for your locale
Plan:

a. irrigation and drainage
b. fertilizing
c. pest management
d. planting schedule
e. harvest schedule
f. storage schedule
g. distribution & marketing

Competency: **Prepare the growing medium**
*See **Floriculture** for tasks for this competency.*

Competency: **Plant crops**

Tasks:
Plan planting schedules
Label plants
Plant crop
Transplant seedlings
Identify problems related to seeding failures

Competency: **Manage crop production**

Tasks:
Cultivate plants as necessary
Thin stands if necessary
Water plants as necessary
Apply mulches appropriate for local climatic area
Identify and control pests
Assess and correct plant nutrient deficiencies
Fertilize as recommended for locale and variety
Protect crops from predators

Competency: **Control pests and diseases**

Tasks:
Identify pests and diseases
Safely select appropriate chemical for crops, especially edible ones
Apply pesticide spray
Apply pesticide dust or granular pesticide
Recognize symptoms of pesticide poisoning and provide first aid
Use, store, and discard chemicals safely
(A) Obtain pesticide applicator's license

Competency: **Harvest crops**

Tasks:
Determine stages of maturity
Utilize appropriate harvest method
Classify and grade vegetables for market purposes
Determine yield and losses
Calculate actual returns and profits from sales
Process and store crop for desired use such as:
- a. freezing
- b. canning
- c. drying/dehydrating
- d. field storing
- e. root cellaring
- f. shipping

Prepare crop for display

Greenhouses

Competency: **Understand principles of greenhouse management**

Tasks:
Identify terms and concepts related to greenhouses, including:
- a. angle of incidence
- b. cold frames
- c. flats
- d. foot candle
- e. glazing
- f. hot beds
- g. lath houses
- h. raised beds
- i. shading
- j. thermal blankets

Describe and evaluate greenhouse framing materials
Describe purposes of greenhouses
Identify different types of greenhouses, including:
- a. commercial greenhouses
- b. cold frames
- c. hot beds
- d. home greenhouses
- e. conservatories

Identify how and when various plant growing structures can be used
List the specialized structures used in the greenhouse business

Competency: **Plan, construct, and maintain greenhouse physical facility**

Tasks:
Identify factors involved in greenhouse construction and layout
Determine:
- a. orientation of greenhouse
- b. angle of incidence
- c. size of materials needed for construction
- d. amount of materials needed

Diagram a sun path
Identify greenhouse sunspace demands
Make a greenhouse layout plan
Construct, maintain and repair a greenhouse, including:
- a. reading and interpreting blueprints
- b. building and removing concrete forms
- c. mixing pouring, finishing, and curing concrete
- d. laying concrete blocks
- e. installing and repairing bracing in greenhouse
- f. repairing and hanging gates and doors
- g. applying wood and metal preservatives
- h. cleaning and oiling electric motors on structures
- i. constructing and repairing benches and frames

j. selecting lights according to crop needs
k. installing and servicing sprinkler heads, pipe nozzles and other irrigation equipment
l. painting greenhouse and other structures and equipment
m. repairing minor leaks in roof of greenhouse
m. replacing plastic coverings on temporary structures
n. washing greenhouse glass
o. replacing glass
p. operating and maintaining heating and cooling systems
q. determining costs of repairs
r. developing bill of materials

Construct and repair fences and gates
Install and repair wood siding on buildings and storage bins
Repair metal structures with arc or oxy-acetylene welder

Competency: Identify, select, operate, and maintain greenhouse equipment

Tasks:
Identify the uses of specialized structures in the greenhouse
Clean heating system
Install:
a. electric motors
b. electrical switches
c. water pipe

Repair electrical cords and broken wires
Replace:
a. belts and pulleys
b. fuses
c. lighting fixtures
d. valves in water system and water lines
e. faucets
f. traps in greenhouse heating system

Reset circuit breakers
Wire simple electrical circuit

Competency: Control greenhouse environment

Tasks:
Identify factors of greenhouse environment, including:
a. humidity
b. temperature
c. ventilation
d. light
e. water/irrigation

Explain why light is important to horticultural crops
Explain the effect of extremely intense sunlight on plants
Explain how light can be controlled in a greenhouse
Interpret light meter readings
Determine light intensity
Select appropriate type of artificial lighting
Set automatic light timers
Install black cloth to regulate photoperiod
Apply shading compound to greenhouse glass
Explain the effect of temperature on plants
Identify methods of controlling temperature in the greenhouse
Determine appropriate temperatures for various plants
Control air temperature
Adjust automatic cooling system
Evaluate the effect temperature has on plants
Identify types of moisture conditions important in greenhouse management

Explain the importance of humidity in the greenhouse
Control humidity
Evaluate the influence relative humidity has on plant growth
Control greenhouse water
Understand the importance of air movement in greenhouses
Control air movement
Alter spacing of plants
Hang lath or saran cloth
Regulate carbon dioxide generating equipment
Set timers

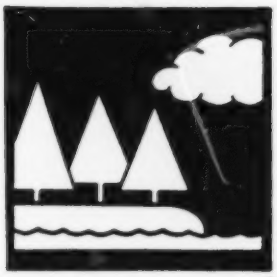
Competency: **Produce greenhouse crops**

Tasks: Prepare the greenhouse growing medium, including

a. identifying greenhouse growing media and amendments
b. determining appropriate soil medium for specific plants
c. preparing compost
d. shredding or screening media as needed
e. pasteurizing soil and evaluate chemical and biological effects
f. monitoring pH and soluble salts

For other tasks related to producing greenhouse crops, refer to ***Floriculture, Vegetable/Fruit Production,*** *and* ***Ornamental Horticulture*** *areas*

Land, Air and Water Management



(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **List employment and educational opportunities in fields related to land, air, and water**

Tasks:
Identify educational and occupational opportunities
Locate resources for finding employment
Identify prospective employers
Identify the work of:
- a. soil conservation officer
- b. air quality technician
- c. water quality technician
- d. waste treatment plant operator

Program SOEP (Coop or OJT) in interest area

II. Use the Resource.

A. Read maps, surveys, and determine land status.

Competency: **Use a map projection**

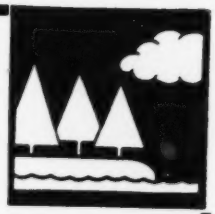
Tasks:
Differentiate between globes and maps
Explain how the following are produced:
- a. cylindrical projection
- b. conic projection
- c. polyconic projection
- d. plane projection

Competency: **Use a compass**

Tasks:
Read magnetic bearings
Explain declination, variation and deviation
Adjust compass
Find compass error and make compass corrections
Determine true azimuth
Define orientation terms
Follow a map using a compass

Competency: **Interpret maps**

Tasks:
Define mapping terms including those relating to public lands
Orient map
Locate and read meridians
Locate and read latitude and base line
Interpret public lands scales and contour lines
Read contour maps
Make a contour map from data
Draw a simple profile



Identify range lines and township lines
Identify sections
Identify divisions of sections
Locate properties by coordinates
Determine land ownership and status
Locate and identify field boundaries
Use topographical and aerial photographs
Record acreage in field by making measurements
Interpret legal land descriptions
Prepare land capability maps from soil maps and data

Competency: Measure horizontal distances

Tasks: Use:

a. chains
b. philadelphia rods
c. transits
d. compasses
e. theodolites
f. E.D.M.'s
g. hand level or engineering level

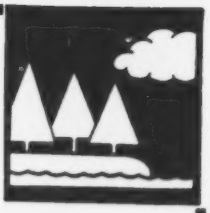
Define horizontal distance skills
Measure distances with a surveyor's tape
Make linear corrections for temperature
Calculate proper tape tension to use
Make linear corrections for slope
Read tapes
Take taping notes
Use surveying signals and numbers
Determine volumes of earth
Locate best site for engineering practices

Competency: Measure vertical distances

Tasks: Define terms related to vertical distances
Read a philadelphia rod using vernier
Set up and level a transit-level
Make accurate rod readings through level
Complete differential level to closure
Make site survey
Perform duties of rod person
Perform duties of instrument person
Measure degree of slope

Competency: Measure angles

Tasks: Define angle measuring skills
List parts of a transit
Set up and read transit
Measure angles
Use tripod
List parts of Theodolite (K&E)
Set up Theodolite
Measure horizontal angles with Theodolite
Compute traverse computations
Complete stadia survey



Competency: **Record surveying data**

Tasks:
Define surveying terms relating to recording data
Keep daily record of work accomplished
Maintain plan records
Write reports
Prepare requisitions
Keep personnel records and information
Record field data
Take surveying notes for the following:
a. horizontal distance
b. differential level
c. repeating angles
Describe the impact of errors of accuracy and closure

Competency: **Assist surveyor**

Tasks:
Mark measuring points with paint, sticks or stakes
Measure distances between survey points
Cut or clear brush from survey lines
Hold level rod or stadia rod at designated points
Move rod or target following hand or verbal signals
Call out reading to note keeper or record information
Set up and care for surveyors equipment and supplies
Read maps aerial photographs and legal descriptions
Measure acreage
Use photo scales
Record measures on photos or in records
Make rough tracings of maps
Interpret a real estate or land descriptions
Determine locations and other information from maps

Competency: **Determine land status**

Tasks:
Identify terminology portraying land status
Read and write legal land descriptions
Use a lands record system
Describe how to procure simple easements

B. Test soil.

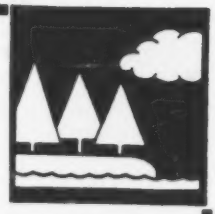
Competency: **Test soil**

*For tasks in soil testing, see **Soil Science/Agronomy IV.***

C. Test water.

Competency: **Test and treat water**

Tasks:
Collect water samples
Test water for minerals
Test water for turbidity
Interpret analysis of water samples
Test streams and ponds
Microbiologically test water



Apply principles of water purification
Apply the microbiology of water purification
Identify safe procedures for the operation of chlorinators
Treat water taste and odor problems
Prevent corresion problems
Set up fluoridation systems
Prevent cross connections and backflow
Prevent water pollution

Competency: **Meet drinking water standards and abide by regulations**

Tasks:
Monitor contaminant levels
Monitor microbiological quality of drinking water
Monitor chemical quality of drinking water
Monitor radionuclides of drinking water

Competency: **Produce potable water**

Tasks:
Identify quality of water required and necessary treatment
Describe the characteristics of and use coagulants
Identify and use several different types of water filters
Describe the characteristics of softeners
Identify the purposes of aeration equipment
Treat for parasites and disease
Remove toxic chemicals

Competency: **Make calculations and measurements in hydraulics**

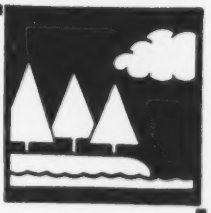
Tasks:
Identify principles of hydrology and water quality control
Calculate pressure in P.S.I.
Explain the principles of water at rest
Demonstrate principles of fluid flow
Measure fluids
Measure electricity
Calculate water volume
Use ratios, percentages, p.p.m. and constants to solve problems dealing with water
Describe water use and development

Competency: **Understand water use laws in Alaska**

Tasks: Define:

a. riparian water rights
b. prior appropriation
c. irrigational and municipal water laws
d. navigational water rights
e. seashore water rights
f. instream use rights

D. Test air.



Competency: **Understand components of the atmosphere**

Tasks: Identify gases in the atmosphere including:

a. oxygen
b. nitrogen
c. carbon dioxide

Identify layers of the atmosphere including:

a. troposphere
b. stratosphere
c. mesosphere
d. termosphere
e. ionosphere

Explain how the atmosphere is heated
Contrast conduction, convection, and radiation
Explain the greenhouse effect

Competency: **Sample gases for ambient particulate level**

Tasks: Sample air using:

a. high volume sampler
b. cascade impactor
c. dustfall collector
d. adhesive impactor
e. tape spot sampler
f. five gas sampler
g. lead peroxide candle

Maintain the above test equipment
Use accessory equipment related to the above samples including:

a. scales
b. driers

Competency: **Evaluate sources of combustion**

Tasks: Determine density or opacity of smoke from combustion sources by using the Ringlemann-type Smoke Chart
Determine density or opacity of smoke from combustion sources by using the calculation method designed by the U.S. Bureau of Mines
Use the following instruments used in evaluating combustion:

a. draft gauge
b. thermometer
c. carbon monoxide indicator
d. carbon dioxide indicator

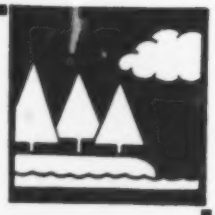
(A) Competency: **Select and install air pollution sampling equipment**

Tasks: Select sites for installing gaseous and particulate samplers
Select sites for installing wind instruments, paying attention to:

a. location on or near a building
b. location in a rural area

Secure and maintain sampling equipment by:

a. providing a stable base
b. providing electrical power
c. protecting sampling station from vandalism



Competency: **Record and analyze particulate and gaseous sampler data**

Tasks: Record data from:

a. dustfall collector
b. high volume sampler
c. tape spot sampler (gas and particulate)
d. five-gas sampler
e. lead peroxide candle
f. cascade impactor
g. adhesive impactor

Satisfy requirements of the Standard National Air Surveillance Network (N.A.S.N.) form
Use equipment to analyze samples, including:

a. gruber comparator
b. tape spot evaluator
c. muffle-type laboratory furnace

Complete air quality reports

Competency: **Understand the effects of topography and weather on air pollution**

Tasks: Identify weather factors conducive to high air pollution potential
Identify the effects of topographical types on the transportation and diffusion of pollutants in a local area
Use instruments to record wind behavior including:

a. wind vanes
b. wind anemometers
c. dual-channel strip-chart recorders

Predict breakups or occurrences of air inversions according to weather forecasts and wind sensors
Explain "heat island" and "haze dome" effects and their relationship with air pollution

Competency: **Evaluate odors**

Tasks: Determine odor sources for specific odors
Rate odors using a standard odor quality scale
Rate the intensity of odors using the Psychophysical Intensity Scale
Complete an odor patrol report form concerning a community odor
Complete a community odor survey and evaluate its results

Competency: **Test noise**

Tasks: Use a sound-level (decibel meter)
Read fluctuations in noise level on the decibel meter
Explain federal and state regulations related to noise pollution
Evaluate a residential sites' exposure to transportation noise
Evaluate an air operations area's exposure to transportation noise

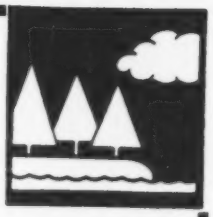
III. Manage and Protect the Resource.

Competency: **Protect land resources**

Tasks: List steps in establishing a sanitary landfill
Control erosion

a. plant trees and grasses
b. place rip rap on river banks
c. plant protective hedges

Develop measures that will maintain or enhance fish and wildlife habitat where development is planned



Competency: Protect water resources

Tasks:
- Explain how to build settling ponds
- Explain how to install septic tanks
- Explain how to avoid pathogenic contamination
- Measure characteristics indicating water quality
- Treat water
- Explain sewage treatment in private dwellings
- Explain sewage treatment in municipalities
- Explain ways to conserve water resources in sewage treatment
- Explain the necessity for water conservation
- Explain water conservation in terms of projected community needs and supply
- Identify steps to assure future water supply

Competency: Protect air resources

Tasks:
- Describe catalytic burners
- Describe emission control devices
- Describe electro-static precipitators

IV. Define the Resource.

Competency: Understand the nature and properties of soil and soil formation

Tasks:
- Characterize soil profile horizons
- Identify components of soil including:
  - a. living organisms
  - b. mineral matter
  - c. organic matter
- Classify soil water by how it is utilized including:
  - a. hygroscopic soil water
  - b. capillary soil water
  - c. gravitational soil water
- Identify factors responsible for the formation of soils including:
  - a. parent material
  - b. climate
  - c. plants and animals
  - d. topography
  - e. time
- Differentiate among:
  - a. igneous rocks
  - b. sedimentary rocks
  - c. metamorphic rocks

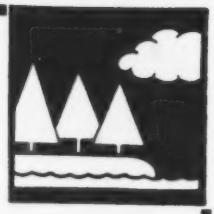
Competency: Understand components of air and their role

Tasks:
- Identify the chemical makeup of air
- Explain the formation and importance of oxygen
- Identify the role of the ozone layers of the atmosphere
- Identify the role of wind in erosion

Competency: Understand components of water

Tasks:
- Identify the chemical components of water
- Explain unique characteristics of water
- Identify the role of water in erosion

V. Understand the Importance of the Resource.



Competency: Understand the importance of land resources

Tasks: Explain the importance of:

a. wild spaces
b. forest resources
c. agriculture resources
d. land for housing
e. wildlife and fish habitat

Competency: Understand the importance of water resources

Tasks: Explain the importance of:

a clean drinking water
b. water to cool power plants
c. water for irrigation
d. water for transportation
e. wetlands and estuaries
f. watersheds
g. water for fish and wildlife

Competency: Understand the importance of air resources

Tasks: Explain the air requirements of living things
Explain the need for clean air
Explain protective features of the ozone layer
Identify the role of the atmosphere in the water cycle

VI. Understand competing uses.

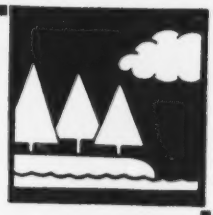
Competency: Understand human-caused problems associated with land, air, and water

Tasks: Characterize types of human-created pollution including:

a. sewage
b. industrial
c. pesticides
d. silt & sedimentation
e. thermal
f. nuclear
g. air pollution
h. noise
i. organic debris (eg. logging wastes, fish processing wastes

Competency: Understand the effects of air polluting particulates and gases

Tasks: Define types of pollution
Identify reasons pollution is often ignored instead of alleviated
Explain the detrimental health hazards associated with industrial pollution, including agriculture
Compare the amount of pollution produced by various types of fuel
Describe the chemical reaction that forms smog
Contrast smog and ice fog
Locate areas prone to smog in the United States and Alaska
Identify effects of smog
Name and discuss sources of polluting particulates
Describe the role of wood stoves in air pollution



Explain sources and effects of indoor air pollution
Explain the effects of specific gases and particulates on human health, plant life, and the durability of materials
Identify which pollutants are most harmful to human health, plant health, and the wear life of materials
Identify federal standards which divide safe concentration levels from unsafe concentration levels of specific air pollutants

Competency: Understand acid rain concerns

Tasks:
Describe terms and principles associated with acid rain
Explain the water cycle
Describe the significance of acid rain
Explain factors that compound the problem of acid rain
Identify geographical areas most affected by acid rain
Explain implications on national and international policies

Competency: Understand effects of thermal pollution on lakes and streams

Tasks:
Identify terms and principles associated with thermal pollution
Explain why power plants produce waste
Identify ways that waste is dissipated in modern power plants and industrial processes

Competency: Identify effects of water-polluting substances

Tasks:
Explain impacts of:
a. Logging debris deposition in streams
b. Siltation of streams, lakes, and lakes by road and pipeline construction, placer mining, etc.
c. Introduction of organics into streams and lakes
d. Introduction of toxic materials

Competency: Understand impacts of power generation

Tasks:
Explain impacts of:
a. coal-generated power
b. nuclear-generated power
c. using wastes for power generation
d. using petroleum-based power generation

Explain impacts of alternative methods of power generation such as:
a. wind generation (e.g. unsightly wind towers)
b. ocean power (e.g. closing off estuaries for tidal dams)
c. biomass power (e.g. wood smoke pollution)
d. hydro power (e.g. destruction of salmon streams)

Fishing and Fisheries

(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **Identify employment and educational opportunities in fishing and fisheries**

Tasks:
Identify educational and occupational opportunities
Locate resources for finding employment
List prospective employers
Identify and implement SOEP, Coop, or OJT
Identify work in:

a. fisheries enhancement
b. hatcheries
c. commercial fishing
d. canneries
e. cold storages
d. equipment and facility maintenance
e. fish and game biology
f. fish and wildlife protection
g. sports fishing
h. fisheries laboratories

II. Use the Resource.

A. Safety

Competency: **Practice personal safety and accident prevention**

Tasks:
Prepare for vessel emergencies
Explain emergency procedures for: fire, collisions, capsize, foundering, man-overboard and personal injuries:

a. alert crew
b. issue personal flotation and immersion protection devices
c. administer first aid to prevent shock and control bleeding
d. administer CPR
e. don survival suit
e. launch and operate lifeboat and life raft
f. close emergency fuel shutoff valves
g. extinguish Class "C" fire
h. act as lookout to keep person in sight who has been lost overboard
i. secure engine room to prevent spread of fire
j. send out distress signals
k. sound abandon-ship alarm

Use cold-water survival skills
Treat victims for hypothermia
Apply first aid
Explain preparation for helicopter rescue
Use life raft survival
Explain survival suit use
Identify shore survival techniques
Identify sources of water and food in a wilderness setting

Competency: **Use boating safety and seamanship skills**

Tasks:
Explain the basic terms and principles of seamanship
Use basic knot techniques
Describe boating laws
Explain navigational aids and charts
Use nautical equipment including:

a. barometers
b. CB
c. compasses
d. dividers
e. fathometers
f. loran
g. marine radios
h. radar
i. sextants
j. sonar

Use marine VHF, using proper procedures, etiquette, and channels
Obtain and explain a current weather forecast
Recognize changes in weather conditions
Recognize importance of US Coast Guard
(A) Complete a USCG license course

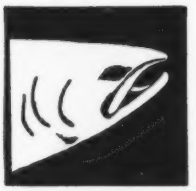
B. Seamanship.

Competency: **Use a tide book, nautical chart, and coast pilot**

Tasks:
Determine tide for a given location
Explain how to determine tide from a known tide level
Use the "Rule of Twelve" to determine tide level at any point in tidal cycle
Identify symbols used on nautical charts
Plot and find directions and distances on a chart
Read current tables

Competency: **Check out and get a vessel underway**

Tasks:
Develop and follow a check list for getting underway
Engage bilge and engine room blowers and bilge pumps
Maintain proper level of coolant in expansion tank
Determine if all navigation lights are functioning
Tighten engine mounts
Inspect fire-fighting equipment for wear, location, and type
Secure deck equipment, lashings, hausers, or mooring lines
Inspect personal flotation devices for number, fit, integrity, and location
Inspect survival suits for number, fit, integrity, location and type
Inspect vessel for fuel leakage
Prepare list of equipment to be checked for oil leakage
Secure watertight doors, hatches, vents, and skylights
Bleed air compressor of water
Check and maintain batteries
Determine fuel levels
Inspect water level indicators for cleanliness
Test radio equipment
Inspect antennas
Determine if hydraulic steering equipment is free of air and water
Determine that rudder stuffing box is functioning properly
Tighten propeller stuffing box
Determine if proper voltage is being generated
File a float plan



Competency: **Maneuver a vessel**

Tasks:
Observe the "rules of the road"
Follow safe boating practices
Pilot using dead reckoning, time, distance, and speed
Use various forms of running fixes including:
a. 45-90
b. 22 1/2-45 c. 26 1/2-45
Pilot using a cross bearing
Use navigational aids, tide and current charts and equipment
Maintain adequate safety margins regarding weather and sea conditions

Competency: **Use the rules of the road**

Tasks:
Identify marine vessel boundaries
Identify terms and definitions related to marine charts and rules of the road
Use steering and sailing rules including:
a. rules when approaching sailing vessels
b. rules for vessels meeting, nearing a bend, leaving berth
c. rules for passing a vessel head on
d. rules for overtaking a vessel
e. general prudential rule
Identify special situation lighting and signals
Plot a course on a chart and convert true bearings to compass bearings
Identify day markers and fog signals
Identify distress signals

Competency: **Use modern electronic systems**

Tasks:
Use echosounders and depthfinders to:
a. differentiate among types
b. interpreting signals
Use Radio Direction Finders (RDF) to:
a. identify range of equipment available
b. install loop antenna
c. use RDF aboard small craft
d. identify marine radio beacon stations and systems
e. plot radio bearing and finding position with RDF
Use RADAR including:
a. install, identify components of, and operate RADAR
b. use RADAR as a navigational aid
c. interpret RADAR signals
d. pilot using RADAR
e. monitor RADAR beacons (RACON)
f. identify radiation hazards
g. install and use RADAR reflectors
Use LORAN C or OMEGA including:
a. explain hyperbolic navigation systems
b. differentiate among groundwaves and skywaves
c. characterize LORAN C and OMEGA receivers
d. navigate with LORAN C

Use SONAR
- a. install, identify components of, and operate SONAR
- b. interpret SONAR signals
- c. navigate and find fish with SONAR

Competency: Use marine lights and sound signals

Tasks: Explain when marine lights are needed
Identify rules for the following situations:
- a. steam vessel underway
- b. steam vessel towing and pushing
- c. sailing vessel and vessels in tow
- d. small vessels
- e. pilot vessels
- f. fishing vessels
- g. stern lights
- h. anchor lights
- i. signals to attract attention

Sound signals for the following situations:
- a. steam vessels underway
- b. sailing vessels underway
- c. vessels at anchor
- d. vessels towing or being towed
- e. speed in fog

Competency: Get along with other members of crew

Tasks: Explain common causes of strife aboard vessels
Explain the importance of getting along with others while at sea
Utilize stress-reduction techniques
Utilize communications techniques
Practice communications techniques with others
Explain how to take a grievance to the captain

Competency: Anchor vessel

Tasks: Anchor vessel by using anchor winch or windlass
Secure anchor on bottom
Retrieve and secure anchor and stack (tier) anchor chain in locker

Competency: Dock a vessel

Tasks: Assign tasks and stations for vessel mooring
Maneuver to dock
Secure mooring lines to dock and/or other vessels
Secure engine room and secure propeller shaft
Release towing gear

C. Building, handling, and maintaining gear

Competency: Build, mend and repair nets and lines

Tasks: Define terms related to net and line construction and repair
Build, mend and repair lines including:
- a. corkline
- b. leadline
- c. weedline
- d. breastline

Melt, tape, or whip line ends to prevent unraveling

Mend nets by:

a. using 1, 2, and 3-bar hole repair
b. trimming problem area
c. initiating starter knot
d. using pick up sider and bar
e. maintaining proper net length with repair

Patch nets by:

a. trimming problem area
b. splitting edges
c. squaring repair patch
d. lacing twine

Complete complicated net and line repairs

Competency: Operate and maintain gear hydraulics

Tasks:
Define basic principles of hydraulics
Diagram vessel hydraulic systems
Use proper hand signals while operating hydraulic equipment

Competency: Maintain and operate processing equipment

Tasks: Explain the maintenance and operating procedures for:

a. freezing equipment
b. canning equipment
c. ice-making equipment
d. auxiliary power generating equip.
e. seafood cleaning equipment
f. conveyor and product handling equip.
g. chilling and cooling equipment
h. testing and quality control equipment

D. Vessel operation and maintenance.

Competency: Conduct deckhand duties

Tasks:
Wear proper clothing for duties
Hand or hoist equipment and supplies aboard
Cast vessel off
Coil lines
Work riggings such as nets, slings, hooks, cables, booms, and hoists
Stand lookout, steering, and engine room watches
Operate dories, dinghies, and skiffs
Attach accessories, such as floats, weights, and markers to nets and lines
Pull and guide nets and lines onto vessel
Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water
Lubricate, adjust, and maintain engines and equipment

Competency: Maintain vessels

Tasks:
Arrange for grid, dry docking, or haul-out
Change brushes in auxiliary engines
Change lube oil and fuel filters on auxiliary engines
Determine if motor bearings are excessively worn
Clean electric motor
Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs
Determine if const-a-voltage regulator is functioning properly
Determine if drive belts on air compressors are excessively loose
Tighten panel box fittings to prevent vibration
Clean keel cool strainers, oil coolers and oil strainers in marine gears

Drain water out of fuel traps
Tighten fuel and oil line connections on engines
Inspect day tanks containing fuel for leaks
Lubricate deck and engine room equipment
Determine vessel's manning requirements
Splice eye into line
Wash down vessel's superstructure and decks
Inspect and maintain hull, keel, and rudder assembly

Competency: Prevent marine corrosion problems

Tasks:
Explain how electrolysis causes marine corrosion
Design appropriate bonding systems for vessel components
Wash, brush, and paint problem areas

E. Other duties and skills.

Competency: Prepare meals aboard the vessel

Tasks:
Plan menus
Order supplies
Store food properly
Prepare a balanced meal
Clean galley deck, woodwork, cabinets, dishes, glasses, flatware, trays, pots and pans
Practice safety with oil stoves
Use a microwave
Use a fire extinguisher

Competency: Maintain and analyze records related to fishing

Tasks:
Maintain trip record
Maintain ship's log
Maintain business ledger
Record catch
Record income
Record fish sales records
Keep expense records
Use checking account
Reconcile bank statement
Inventory assets
Analyze profits and losses including:
a. variable and fixed costs
b. opportunity cost
c. return to labor, management investment
Determine net worth
Apply skills to SOEP, Coop, or OJT

(A) Competency: Secure loans from bank and state agencies

Tasks:
Differentiate among types of credit:
a. commercial credit
b. production credit
c. state loans

Explain the procedure for obtaining a limited entry permit
Keep records related to loan

(A) Competency: Compute the tax liabilities of a fisherman

Tasks:
Calculate estimated tax payments
Calculate depreciation of vessel and other equipment
Calculate investment credit
Calculate sale and exchange of assets
Calculate deduction and substantiation

F. On-board fish handling.

Competency: Understand the importance of fish quality

Tasks:
Explain the importance of maintaining on-board fish quality
Maintain fish quality

Competency: Handle fish correctly aboard the vessel

Tasks:
Explain the importance of good handling practices
Relate catching rates to correct fish handling
Correctly bleed and gut fish
Wash fish
Store fish on the vessel
Unload fish from vessel

Competency: Practice vessel sanitation

Tasks:
Explain the importance of vessel and product sanitation
Use sanitation tools
Use chemical sanitizers
Identify potential sanitation problems

Competency: Store fish aboard the fishing vessel

Tasks:
Explain the importance of chilling seafood
Store fish without refrigeration
Ice fish
Store fish with chilled sea water
Store fish with refrigerated sea water
Freeze fish at sea

G. Marine products processing.

Competency: **Process fish**

Tasks: Describe both shore-based and floating processing operations
Use processing procedures including:

a. assembly-line processing
b. beheading
c. gutting
d. skinning
e. scaling
f. cleaning
g. icing
h. chilling and cooling
i. crating
j. canning
k. cooking
l. drying
m. smoking
n. foil wrapping
o. freezing
p. maintaining quality control
w. shipping live

Explain steps involved in roe processing

Competency: **Handle and process marine products**

Tasks: Store fish products using icing and refrigeration
Clean seafood
Use quality control in processing
Keep seafood cool, clean, moist and moving
Pack fish eggs for shipping
(A) Trace marine products from the ocean to the retailer
(A) Explain economics of seafood processing
(A) Explain marketing considerations involved in proper seafood handling

Competency: **Maintain fish quality during storage and shipping**

Tasks: Explain the importance of chilling seafood
Define fish processing and refrigeration terms
Identify fish processing sanitation principles and procedures
Determine how long various marine products can be preserved by refrigeration
Identify potential chemical, biological and bacteriological problems in the fishing industry

a. conduct bacteria tests
b. identify problems by sight and smell
c. dispose of contaminated marine products
d. recognize how to anticipate and prevent sanitation problems before they occur

Explain upper and lower refrigeration temperature limits for the various marine products

a. recognize potential sanitation problems
b. explain disinfecting procedures
c. plan stock rotation to insure freshness
d. control temperature during processing

Control/modify atmosphere storage of product
Freeze product
Ship processed product

Competency: **Sanitize seafood plant**

Tasks:
Explain the importance of cleaning and sanitizing seafood plant
Use cleaning equipment
Use chemical sanitizers
Control pests
Maintain personal health and hygiene

H. Actively fish.

Competency: **Net fish**

Tasks:
Explain principles and techniques associated with various net fisheries
Locate quarry using equipment available
Operate and maintain net fishing equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets
Operate and maintain seine equipment such as purse seine, haul, drag, or beach seine and power skiffs
Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set, tow, and anchor net as required
Tow net to location and anchor in place
Attach appropriate flags and lights to buoys to mark and identify nets
Haul net with appropriate gear
Remove catch using appropriate techniques and equipment such as dip net, brail buckets, hydraulic pumps, conveyor, lifting net, blocks, tackles, and dumping catches
Clean, store and transfer catch appropriately
Sort and clean fish, throwing undesirable and illegal catch overboard
Stow catch in hold or transfer to tender
Repair fishing nets and gear
Complete minor repairs of engines and equipment
Wash deck and equipment

Competency: **Line fish**

Tasks:
Define line fishing terms
Explain principles and techniques associated with various line fisheries
Lay out gear
Attach:
a. hooks
b. bait
c. sinkers
d. anchors
e. floats
Anchor bottom line for bottom fishery
Cast line into water and hold, anchor, or troll for troll fishery
Retrieve gear onto boat deck by hand, reel, or winch
Haul line by hand or reel and winch onto deck
Unload fish from boat
Clean, pack and store catch appropriately
Slit fish, remove viscera, wash cavity and prepare for storage
Wash deck and equipment using brush, detergent and water
Lubricate and make minor repairs to engines and equipment

Competency: **Pot and trawl fish**

Tasks:
Define pot fishing terms
Explain pot fishing techniques
Rig boat and deploy gear such as pots, floats and markers
Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water
Retrieve gear and remove catch
Hook marker float with pole and haul up pot
Remove catch or dump catch on deck
Measure catch with fixed gauge
Place legal catch in container and return illegal catch to sea
If applicable, rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle
Store catch aboard vessel

(A) Competency: **Plan and implement mariculture venture, SOEP, Coop, or OJT**

Tasks:
Gain capital securities
Obtain required permits and necessary statements
Complete business plan including:
a. five-year cash flow plan
b. production system
c. construction and operating costs
d. expected problems and solution
e. projected market supply and demand
f. projection of overall stability and flexibility

(A) Competency: **Analyze economic factors related to a mariculture venture**

Tasks:
Analyze economic factors including:
a. tenure of site
b. initial capital investment for constructing and operating
c. environmental conditions which will affect production cost
d. level of security needed
e. transportation means and distance to marketplace
f. local competitors
g. type and cost of personnel

(A) Competency: **Select species for mariculture venture**

Tasks:
Analyze viability of species including:
a. sources and availability of stocking species
b. stocking density and rates
c. feeding requirement and sources, availability, cost, quality, quantity, etc.
d. growth rates
e. behavioral response to environmental stress, handling, and transporting
f. vulnerability to disease and predators, and response to treatment
g. behavior patterns which will influence management strategies
h. harvesting strategies and frequencies

Analyze marketability of selected species including:
- a. demand throughout the year and its stability
- b. supply throughout the year and degree of saturation
- c. wholesale and retail prices
- d. consumer's preferences
- e. similar and substitute products
- f. expenses and cost
- g. gross and net profits
- h. rate of return

(A) Competency: Locate feasible mariculture site

Tasks: Analyze environmental resources including:
- a. sea conditions
- b. bottom conditions
- c. topography of site and surrounding areas
- d. climatic conditions
- e. other uses of site
- f. accessibility throughout the year
- g. activities of surrounding area
- h. other marine resources present and impacts of mariculture development

(A) Competency: Construct and maintain mariculture site

Tasks: Examine area

Sketch out design, taking into account:
- a. biological needs of the cultured species
- b. ecological needs of the cultured species
- c. utilizing topography and environment so as to minimize operating costs
- d. keeping harvesting methods efficient
- e. keeping construction costs minimal

Remove obstacles which may interfere with operations

Select appropriate type and size of cage to:
- a. meet the biological need of the cultured species
- b. withstand the elements
- c. endure pressure of water current and when transporting
- d. screen out predators

Examine unit cost per cage in relation to operating, harvesting, yields, and net profit

Design cage lay-out system considering:
- a. position of cages in water column
- b. water quality and circulation
- c. predators
- d. disease
- e. ease of cultivation
- f. ease of transportation
- g. unexpected problems
- h. security

Construct cages to endure interaction with environment

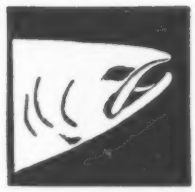
Install and secure cages

Maintain cages

(A) Competency: Stock and maintain species in cages

Tasks: Calculate proper stock density considering:
- a. natural productivity
- b. the need for supplemental feeding and/or fertilizer
- c. the size of the cages
- d. biological characteristics of the target species
- e. economic (profitability) factors

Check that stocking material are healthy



Acclimate stocking material to sea water and sea water temperature and release
Determine available natural food source by analyzing:
a. quality of food present
b. quantity of food present
c. environmental influences including temperature, sunlight, and water chemical characteristics
d. characteristics of the cage
Clean cages of undesirable sea life
Select feeds to meet nutritional requirements of target species
Determine feeding rates and amount
Mix, mince, dry, and/or cook foods as needed
Store foods
Apply feeds manually, mechanically, and/or automatically

(A) Competency: Harvest mariculture fish and/or material

Tasks:
Net, trap and/or lift material from cages
Process fish and/or material, including:
a. sorting and grading
b. chilling or putting fresh material in tanks
c. freezing whole, tails only, or fillets, depending on market
Transport fish and/or material to market

(A) Competency: Increase production as feasible

Tasks:
Increase production by:
a. expanding numbers of cages
b. manipulating stocking frequency and rates
c. sorting population size and/or ages, then segregating into different ponds
d. using supplemental feeding techniques and formulas
e. altering harvesting techniques

III. Manage and Protect the Resource.

Competency: Understand the important state and federal regulations and regulatory agencies pertaining to fisheries

Tasks:
Identify the role of:
a. State Board of Fisheries
b. fishery advisory committees
c. International Halibut Commission
d. Alaska Department of Fish and Game
e. Alaska Division of Fish and Wildlife Protection
f. U.S. Coast Guard
Identify rules pertaining to catch and size for local fishery - include throwing illegal catch overboard

Competency: **Understand the important state and federal regulations and regulatory agencies pertaining to navigation**

Tasks:
Identify different classes of vessels including:
a. Class A
b. Class 1
c. Class 2
d. Class 3
Register vessel and display number on boat
Explain how vessels and/or captains may take passengers for hire
Explain enforcement of rules of navigation
Identify the role of the U.S. Coast Guard
Explain rules pertaining to distressed vessels

Competency: **Understand fish management practices**

Tasks:
Assess fish stock
Explain concepts of sustained yield fishery
Explain concepts of limited entry fisheries
Identify the consequences of fishery over-exploitation
Explain the future of local and statewide fisheries
Trap and strip fish
Maintain rear ponds
Stock lakes and streams
Rehabilitate waters
Explain how to rescue fish
Survey fish
Remove rough fish
Improve spawn areas
Explain enforcement of proper fishing harvest laws and fish habitat protection laws

(A) Competency: **Define important factors for hatchery placement**

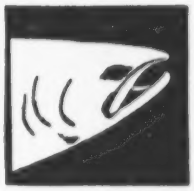
Tasks:
Contrast early salmon hatcheries with contemporary ones
Explain the need for salmon hatcheries
Explain a hatchery's need for a steady water supply
Explain environmental factors of salmon hatchery placement
Explain the importance of proximity to good fish habitat

Competency: **Define important hatchery techniques**

Tasks:
Explain salmon hatchery spawning
Explain salmon hatchery incubation
Explain the feeding of salmon fry
Explain the issue of fish disease in hatcheries
Explain how hatchery smolt are released

Competency: **Work in a hatchery**

Tasks:
Complete paperwork related to hatchery
Construct and maintain incubation system
Collect adults to serve as brood stock
Transport milt and eggs
Fertilize eggs
Monitor eggs during incubation



Identify various developmental stages
Remove dead fish and eggs
Determine survival rates at various stages of development
Maintain environmental factors promoting the development and survival of eggs, fry, and adults
Collect and analyze samples from incubation water
Mark released fry
Monitor return runs to establish survival rates
Collect, record, and analyze data obtained

Competency: **Care for fish in a hatchery**

Tasks:
Explain salmon development from unfertilized egg to adult salmon
Define anadromous
Identify salmon hatchery procedures
Identify internal and external characteristics of salmon anatomy
Identify environmental factors affecting salmon survival
Identify natural events and cycles affecting salmon survival

Competency: **Manage salmon**

Tasks:
Identify agencies involved in management of Alaska's salmon
Explain different methods for assessing the fishery
Identify the goals of salmon management

IV. Define the Resource.

Competency: **Understand Alaska's water resources**

Tasks:
Explain the origins of the oceans
Examine the geology of Alaska's sea bottom
Point out major tidal areas in Alaska
Explain possible effects of water pollution on Alaska's water resources
Point out locations of major Alaskan fisheries
Identify major Alaskan seaports
Identify major Alaskan watersheds

Competency: **Identify attributes of Alaska's commercial fish species**

Tasks:
Understand attributes of salmonids including:
a. external anatomy
b. internal anatomy
c. classification
d. distinguishing characteristics
e. life histories including:
    1. embryology
    2. life history stages

Identify attributes of bottomfish including:
a. anatomy
b. classification
c. distinguishing characteristics
d. life history including:
    1. embryology
    2. life history stages

Identify attributes of dungeness, tanner, and king crabs including:
- a. anatomy
- b. classification
- c. distinguishing characteristics
- d. life history including:
  1. embryology
  2. life history stages

Identify attributes of shrimp including:
- a. anatomy
- b. classification
- c. distinguishing characteristics
- d. life history including:
  1. embryology
  2. life history

Identify the natural foods of fish including:
- a. aquatic insects
- b. plankton

Age fish by:
- a. scales
- b. otoliths
- c. bones
- d. back calculations (growth)

Use plankton net in studying microscopic water life
Use hand dredge for examination of bottom samples
Use seines for identification of small forage fish
Identify Alaska's under-utilized marine resources

Competency: **Understand the life cycles of Pacific salmon**

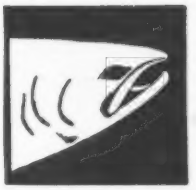
Tasks: Explain the:
- a. hatching process of salmon
- b. life processes of salmon fry
- c. life processes of adult salmon
- d. reproductive phase of salmon
- e. importance of dead salmon to stream replenishment
- f. issue of man-made hindrances to salmon reproduction

V. Understand the Importance of the Resource.

Competency: **Understand the economic importance of fishing to Alaska**

Tasks: Understand the importance of marketing fisheries resources to the viability of Alaska's fishing industry
Identify the relative dollar value of the Alaskan fishing industry
Locate important Alaskan fishing ports on a map
Identify potential expansion in the fishing industry including:
- a. salmon farms
- b. oyster farms
- c. other shellfish and finfish mariculture developments
- d. bottom fishery

Explain the importance of seafood in the life and economy of Alaska
Contrast life histories of the major commercial fishery species of Alaska
Contrast methods, vessels and gear involved in the Alaskan commercial fisheries
Explain how fisheries managers attempt to regulate the fisheries to the mutual benefit of the resource and the fisherman



Compare and contrast the following fisheries:

a. salmon
b. halibut
c. herring
d. king crab and tanner crab
e. bottom fish
f. shrimp and other invertebrates
g. shellfish

Identify different species within each fishery
Identify gear and vessels used for each fishery

Competency: Understand the traditional importance of fishing to Alaska

Tasks: Trace the history of the marine harvest in Alaska including:

a. historic Native harvest
b. Russian fur trade
c. turn of the century canneries

Relate the importance of fishing to Native Alaskan cultures
Contrast the Native salmon fishery past and present with the non-Native salmon fishery
Project future trends in Alaska's fisheries

Competency: Understand the international importance of fishing to Alaska

Tasks: Identify foreign fishing fleets which frequent Alaskan waters
Identify international rules and regulations which pertain to fishing in Alaskan waters
Identify boundaries of U.S. fishing regulations

VI. Understand Competing Uses.

Competency: Understand the role of fisheries management

Tasks: Explain the importance of fisheries management
Identify general management policies related to fish species including:

a. sport fish
b. rough fish
c. forage fish

Identify general management policies related to fish habitat management

Competency: Understand forces competing for Alaska's fishery resources

Tasks: Identify state, national, and international groups competing for Alaska's fishery resources
Explain the introduction of shellfish and finfish mariculture on traditional fisheries

Forestry, Production and Processing

(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **Understand employment and educational opportunities in forestry management, production, and processing**

Tasks:
Describe the scope of the forest industry
Identify educational and occupational opportunities
Locate resources for finding employment
Confer with prospective employers
Identify work in:

a. timber stand improvement
b. nurseries
c. commercial logging
d. saw mills
e. lumber yards
d. equipment and facility maintenance
e. forest management
f. forest protection
g. forest planning
h. forestry research

Identify relative numbers of jobs available in above areas
Identify organizations which employ persons trained in forestry
Identify employment policies related to employment in forestry
Plan and implement an SOEP, Coop or OJT

II. Use the Resource.

Competency: **Understand timber management techniques**

Tasks:
Identify logging terms, principles and techniques
Describe state and federal logging laws
Develop a logging plan taking into account:

a. forest resources
b. soil conservation
c. forest conservation
d. wood level planning
e. fish and wildlife habitat protection

Competency: **Understand timber harvesting techniques (basics of silviculture)**

Tasks:
Describe the methods, purposes and advantages/disadvantages of several harvest practices, taking into account even and uneven aged forests, including:

a. clearcutting
b. seed-tree cutting
c. shelterwood cutting
d. selection cutting

Identify different logging systems including:

a. aerial
b. highlead
c. skyline
d. ground
e. tractor
f. rubber tired

Competency: **Complete a rough land survey**

Tasks:
- Explain basic surveying terminology and principles
- Use a hand compass and staff compass to run a property line
- Obtain legal land descriptions
- Read legal descriptions
- Read legal plats
- Make slope corrections
- Read aerial photos with stereoscope
- Determine pace factor
- Run directional line

Competency: **Measure a stand (cruise timber)**

Tasks:
- Explain timber cruising terms and principles
- Map tree types of given area
- Pace and measure given plots
- Determine the height of trees using a clinometer, Abney level, Relescope, and hypsometer
- Determine the diameter of trees using a diameter tape or Biltmore stick
- Determine the number of 16-foot saw logs in given trees using a cruiser's stick
- Identify defects in trees
- Install cruise plots and determine volume of stand
- Use tree volume table
- Calculate gross and net volumes

Competency: **Scale logs**

Tasks:
- Explain timber scaling terms and principles
- Name tools and equipment needed for proper scaling
- Use and contrast International 1/4-Inch and Scribner Log Rules
- Use a log rule to determine the board measure of different sized logs
- Use a scale stick to determine log volume
- Determine defect deductions
- Use log volume tables
- Record log volumes

Competency: **Survey roads**

Tasks:
- Use:
  - a. rod
  - b. tape
  - c. transit
- Take surveying notes
- Place and read stakes
- Complete a differential level
- Work safely around heavy equipment
- Read road profiles

Competency: **Use an axe**

Tasks:
- Describe the proper use and care of an axe including use of file and bench grinder
- Demonstrate the proper safety precautions for using an axe
- Split with the axe
- Buck log with axe

Competency: **Use a chain saw**

Tasks:
Describe and name the various parts of a chain saw
Describe relevant fire regulations in relation to chain saw use
Demonstrate proper safety procedures in operating and handling a chain saw
Service chain saw
Use the proper procedures for operating a chain saw in the forest including:

a. operate the saw safely
b. mix fuel
c. oil the chain
d. adjust chain tension
e. sharpen chain
f. maintain oil level
g. clean air filter
h. limb timber
i. fell timber
j. prepare the chain saw for storage

Use bench grinder and chain sharpener including:

a. adjust rests
b. wear safety goggles
c. test and replace grinding wheels
d. dress the wheel

III. Manage and Protect the Resource.

Competency: **Improve stands**

Tasks:
Describe several goals of stand improvement
Identify undesirable types of trees to be removed for stand improvement including:

a. wolf or spreading trees
b. crooked trees
c. trees with forked trunks
d. over-mature trees
e. dead, damaged, or diseased trees

Identify impacts of stand improvement on fish and wildlife habitat
Read and interpret a stand table for stand improvement data
Describe the difference between a pure stand and a mixed stand
Describe the differences between an even aged stand an an uneven-aged stand
List several reasons or purposes for thinning a forest
Recommend a specific thinning technique for a specific stand
Fertilize tree stand
Thin tree stand
Prune tree stand

Competency: **Control undesirable brush and weeds**

Tasks:
Identify available herbicides and their functions
Identify methods of application of herbicides
Control burn

Competency: Reforest

Tasks: Reforest through natural means including:

a. recognize seed crop
b. prepare the site (excluding scarification)

Reforest through artificial means, including:

a. define tree planting terms, tools, principles and methods
b. prepare site for tree planting
c. dry, remove seeds, and de-wing seeds
d. store seeds
e. test seed germination
f. identify seed collection
g. determine the time for planting tree seedlings
h. plant tree in nursery bed
i. handle and transport seedlings
j. collect ripe seed cones

Hand plant seedlings by use of:

a. mattock
b. planting bar
c. planting machine

Competency: Manage Insects

Tasks: Describe the major ways in which insects damage trees including:

a. defoliating insects
b. girdling insects

Identify insects which have been destructive to trees in Alaska including:

a. spearmark black moth
b. spruce budworm
c. hemlock sawfly
d. ips
e. bark beetles

Recognize insect damage to trees
Identify situations particularly inviting to certain pests
Directly and indirectly control forestry insect damage
Use pesticides safely (if appropriate)

Competency: Control forest diseases

Tasks: Define terms related to trees and tree diseases including:

a. bark
b. blight
c. blister
d. defoliating
e. growth rate
f. parasite
g. pest
h. rot
i. rust
j. wilt
k. wood fiber

Describe different ways in which diseases damage trees:

a. kill or deform
b. decrease growth rate
c. destroy heartwood

Identify common disease types
Identify tree damage caused by disease
Control forest diseases
Use pesticides safely
Identify cases where tree disease may actually be beneficial to tree stands or commercial harvest of tree stands or may benefit other forest resources such as wildlife
Identify cases where tree disease may be extremely harmful to tree stands or commercial harvest of tree stands

Competency: **Understand the principles of fire ecology**

Tasks:
Identify plant communities damaged or benefited from fire
Identify the effect of fire on wildlife habitat
List the post-fire successive stages of major plant groups in Alaska
Identify the effects of fire on plant succession
Explain controlled burns

Competency: **Understand basic tenets of wildland fire control**

Tasks:
Define the terms associated with forest fires, such as wildfires and controlled burns
Explain the principles associated with fire ecology
Explain important fire prevention and control techniques
Explain controlled burning techniques
Explain how to construct fire lines
Explain safe fire-fighting practices
Identify and be able to locate/contact agencies responsible for fire control in Alaska

Competency: **Understand fire behavior**

Tasks:
Explain terms and principles integral to fire behavior including:
a. fire triangle
b. ignition temperature
c. heat sources for ignition
d. weather factors in fire behavior
e. principles of heat transfer
f. forest fuels and their effect on fire behavior
g. effects of topography on fire behavior
h. fire-caused environment
i. temperature and moisture
j. air masses and fronts
k. general circulation and local winds

Explain how clouds serve as indicators of weather changes
Predict winds
Explain the role of basic weather forecasting in understanding fire behavior
Use a weather field kit
Calculate rate of fire spread based on fire behavior knowledge including:
a. use of computer in figuring fire spread
b. prediction of extreme fire behavior conditions
c. preparation of suppression plan based on weather forecasts

Competency: **Use the pulaski, fire rakes, and fire shovels**

Tasks:
Wear proper clothing and other safety equipment when using the pulaski, rakes, and shovels
Balance, swing, and use the pulaski
Use rakes and shovels
Use a file to sharpen pulaski, rakes, and shovels
Replace broken pulaski, rakes, and shovel handles

Competency: **Set up pumps**

Tasks:
Use positive displacement pumps
Use centrifugal pumps
Set nozzle pressure

Competency: **Lay hose**

Tasks:
Identify fittings and explain their function
Contrast advantages and disadvantages of several hose materials
Explain friction loss in fire hoses
Explain pressure loss through elevation
Explain how pumps in series can increase pressure
Explain how pumps in tandem can increase volume
Determine hose lay
Determine the quantity of hose needed for particular fires

Competency: **Control fires**

Tasks:
Use the Planar Intercept method in determining amount of dead fuel
Identify types of forest fires including:
a. crown
b. surface
c. ground
Trace major causes of fires
Trace a history of forest fires in Alaska
Explain the use of fire plan maps
Explain the use of a forester burning index meter
Explain the necessity of burning permits
Describe the place of prescribed burning in game management
Explain the issues associated with wildfires in wilderness areas
Describe international (Canadian) agreements/understandings regarding fires on international boarders
Identify the principles of sizing up a wildland fire
Determine the capability of firefighting forces
Select firefighting forces
Locate control lines
Use firefighting tactics
Identify basic organizational requirements for wildland fires
Process fire orders, fire reports, and records
Effectively communicate at the fire

Competency: **Control other dangers to forests**

Tasks:
Explain unwise human forest harvest methods
Identify damages of unwise livestock grazing in forests
Identify damage from over-browsing from wildlife
Identify wind damage to trees
Identify frost and snow damage to trees
Identify animal damage to trees occurring from:
a. porcupines
b. deer
c. moose and caribou

IV. Define the Resource.

Competency: **Understand major principles of botany**

Tasks:
- Identify principles of plant growth
- Name parts of plant cells and explain their function
- Explain the reproductive processes of plants
- Trace the process of photosynthesis
- Identify major classifications of the plant kingdom

Competency: **Understand main principles of forest ecology**

Tasks:
- Trace stages of forest plant succession including:
  - a. pioneer weed stage
  - b. shrub stage
  - c. sub-climax or transitional forest stage
  - d. climax forest tree stage
  - e. post-climax stage
- Compare and contrast the role of natural agents of succession (i.e., wildfire, floods) vs. manmade processes such as logging
- Explain the role of plant quadrant studies, especially in measuring:
  - a. density of species
  - b. dominance of species
  - c. abundance of species
  - d. relative importance of species
- Explain the process of forest microsuccession
- Explain the role of diversity in the forest ecosystem

Competency: **Understand types of soils and uses**

Tasks:
- Explain how soil use affects human cultures
- Explain basic physical properties of soils
- Explain basic chemical properties of soils
- Explain the importance of the moisture content of soils
- Explain peat, how it is created, and its potential uses
- Contrast soil erosion and soil depletion
- Explain the importance of soil conservation in forestry management
- Explain how various types of soils are identified

Competency: **List parts of trees and shrubs**

Tasks:
- Identify basic taxonomy of trees
- Use a key to identify tree species by:
  - a. leaf
  - b. bark
  - c. twig
- Make a tree key
- Make a key of associated plant species

Competency: **Understand stages of commercial stand development**

Tasks:
- Trace stages of commercial stand development including:
  - a. forb-grass
  - b. shrub
  - c. seedling
  - d. sapling
  - e. pole
  - f. saw timber

Competency: **Understand major commercial hardwood and softwood species**

Tasks:
Define the terms and principles associated with growth of hardwood and softwood species
Explain Alaskan tree species and their current and potential commercial value
Identify major hardwoods and softwoods by sawn woods

Competency: **List types and geographic area of trees (and identify economic potential) for different parts of Alaska**

Tasks:
Identify local trees
Trace location of different types of trees in Alaska

Explain the potential for harvesting of different types of trees in different locations in Alaska
Identify the estimated board feet of harvestable timber in various parts of Alaska

Competency: **List forest users and management services**

Tasks:
List major logging companies in Alaska
Identify government and other agencies including:

a. AK Loggers Association
b. AK Women in Timber
c. Bureau of Land Management
d. Bureau of Outdoor Recreation
e. National Park Service
f. Sierra Club
g. Society of American Foresters
h. SE AK Cons. Council (SEACC)
i. State of AK Dept. of Nat. Res. &
j. State of AK Div. of Forestry
k. State of AK Div. of Pks and Otdr Rec.
l. U.S. Forest Service
m. Wilderness Society
n. AK Dept. of Fish & Game

V. Understand the Importance of the Resource.

Competency: **Understand the role of forest products**

Tasks:
List various forest products including:

a. water (watershed)
b. aesthetic attributes
c. food
   1. syrup 2. nuts 3. berries 4. other
d. fiber (wood products)
e. wildlife support area

Explain the relative value to Alaska of the following forestry products:

a. paper
b. lumber
c. chip board
d. firewood
e. house logs

Explain the feasibility of initiating a business with forestry products such as:

a. firewood
b. house logs
c. rough-cut boards
d. furniture
e. Christmas trees

Competency: **Understand various roles of forestry**

Tasks:
Explain a history of outside forestry methods which influenced U.S. forestry
Explain the role of forestry in U.S. history
Explain the role of forestry in Alaskan history
Explain the value of forestry in Pacific Rim markets
Explain the importance of marketing forestry products in order to sell them

VI. Understand competing uses.

Competency: **Understand competing uses of Alaskan forests**

Tasks:
Explain forestry use concepts such as:
a. multiple use
b. sustained yield
c. productivity (biological vs economic)

Explain the relationship of forestry watershed management to Alaska's fisheries
Explain recreation versus economic uses of Alaska's forests
Explain wilderness versus development uses of Alaska's forests
Explain mining versus conservation uses of Alaska's forests (national and state)
Explain wildlife versus economic values of Alaska's forests in relation to different successional stages of the forest
Explain scientific baseline versus economic values of Alaska's forests
Identify the impacts of forestry management practices on other forest resources

Outdoor Recreation

(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **Understand employment and educational opportunities in parks and outdoor recreation**

Tasks:
Identify requirements for jobs in parks and outdoor recreation
Identify educational and occupational opportunities
Locate resources for finding employment
Confer with prospective employers
Identify the work of:
- a. backpacking guide
- b. bus driver in or near parks and recreation areas
- c. bus mechanic for buses in or near parks and recreation areas
- d. bus tour maintenance worker
- e. charter boat operator
- f. clerk in parks and recreation visitor shops
- g. clerk selling camping and hiking equipment
- h. hotel worker in or near parks and recreation areas
- i. mountain climbing guide
- j. naturalist
- k. outfitter
- l. outfitter assistant
- m. park aide
- n. park maintenance worker
- o. park ranger
- p. park technician
- q. recreation aid
- r. restaurant worker in or near parks and recreation areas
- s. ski lift operator
- t. ski patrol person
- u. tour bus driver
- v. tourist guide for Alaska State Parks
- w. tourist guide for city and local parks
- x. tourist guide for private tour companies
- y. tourist guide for state and federal historic sites
- x. tourist guide for the National Park Service
- aa. tourist guide in parks and recreation areas

Plan and implement SOEP, Coop or OJT

II. Use the Resource.

A. Work with People.

Competency: **Manage visitor services**

Tasks:
Greet the visitor
Inform visitors of regulations

Register visitors
Schedule events and programs
Schedule facilities use
Give instructions and directions
Manage the flow of vehicular or pedestrian traffic
Manage visitor requests and complaints
Manage youth groups and events
Take reservations
Develop and conduct a visitors program and tour
Prepare and give a naturalist slide show

Competency: Speak a second language

Tasks:
Use greetings in local Native language
Greet tourists in Japanese, French, and German
Identify cultural differences among parks and recreation area visitors
Consider cultural differences in providing visitor services

B. Use Outdoor Recreation Equipment.

Competency: Operate and maintain equipment and tools

Tasks:
Identify and use hand tools properly and safely
Demonstrate basic mechanical skills useful in a recreational setting
Operate and maintain tractors, machinery and equipment
Maintain records of use, maintenance, and repair on machinery and equipment
Prepare machines and equipment for storage
Develop a project plan using sketches, scale drawings, bill of materials and cost estimation
Safely construct a woodworking project using basic woodworking skills
Prepare and paint metal, wood and masonry surfaces
Identify, select and use common kinds of hardware
Demonstrate basic electrical repair skills
Demonstrate basic plumbing skills

Competency: Take photographs and/or assist visitors in doing so

Tasks:
Describe the major types of cameras and purposes of each
Identify basic parts of the camera and their function including:
- a. body
- b. lens
- c. shutter
- d. diaphragm
- e. viewer
- f. film holding device

Recognize major characteristics of films including:
- a. color
- b. black/white
- c. speed
- d. type (slides, prints)
- e. ease of development
- f. size (35mm, disc, instant, etc.)

Select appropriate film for purpose
Use a 35 mm camera determining/defining/adjusting:
- a. F-stop
- b. shutter speed
- c. film speed
- d. depth of field
- e. contrast (b/w)
- f. graininess
- g. special effects (panning, shading, etc.)

Identify the steps in taking a picture

Explain important accessories for cameras and purpose including:

a. tripods
b. extension tubes
c. telephoto lenses
d. macro lenses
e. filters
f. cleaning kit
g. flashes

Describe methods for photographing wildlife, landscapes, people, and indoor versus outdoor subjects

Operate common video cameras

Competency: Drive a truck or bus

Tasks:

Check all engine fluids
Operate a three speed manual transmission
Operate a four speed manual transmission
Practice caution while transporting passengers
Engage four-wheel drive
Use winch

Competency: Drive a three-wheeler, four-wheeler or other ATC

Tasks:

Wear a helmet
Operate three-wheeler safely
Develop and perform a safety demonstration on three-wheelers
Fuel the three-wheeler
Operate three-wheeler only in designated areas
Tow and back trailer safely

Competency: Use a firearm

Tasks:

Pack and carry a firearm safely
Obtain proper ammunition for firearm
Load and fire a shotgun using slugs
Load and fire a shotgun using buckshot
Load and fire a high-powered rifle
Clean and care for firearm
Store firearm safely

Competency: Operate a boat

Tasks:

Include safety equipment aboard boat
Start outboard
Change spark plugs
Prepare gas and oil mix
Operate a boat safely

Competency: Work safely around aircraft

Tasks:

Practice safety around aircraft including:

a. boarding helicopters forward of loading doors
b. boarding propeller aircraft from the rear
c. boarding only on pilot's signal
d. wearing seat belt
e. not flying flammables in passenger compartment

Competency: **Sell books, film, and curios**

Tasks:
- Greet the customer
- Stock the merchandise
- Display the merchandise
- Protect merchandise from breakage and theft
- Practice courtesy
- Bag items

Competency: **Operate a cash register**

Tasks:
- Carefully key the sale
- Count out money to the customer
- Cash out the register
- Deposit receipts
- Change register tape

C. Work Out-of-Doors.

Competency: **Backpack**

Tasks:
- Identify attributes of quality backpacking gear
- Pack wool, polypropolene, or pile fiber clothing
- Select proper footwear
- Practice low-impact camping

Competency: **Hike**

Tasks:
- Select proper hiking boots for terrain
- Carry proper clothing for locale
- Pack out all refuse

Competency: **Cross-country ski**

Tasks:
- Wear proper clothing for skiing
- Wax skis
- Ski with proper technique
- Identify avalanche hazards

Competency: **Construct temporary camps**

Tasks:
- Build a tent platform
- Erect tent
- Minimize human impact
- Install outhouse

D. Understand the Out-of-Doors.

Competency: Manage flora and fauna

Tasks:
- List plant communities and dominant species within a selected park
- Identify native plant species of a selected area or park
- Identify plant species toxic to animals and humans
- Describe interactions between living and non-living components of an ecological system
- Plan and monitor a controlled burn

Competency: Observe wildlife

Tasks:
- Use a spotting scope
- Use binoculars
- Identify major species of locale
- Differentiate among males and females of given species

E. Use First Aid and Survival Skills.

Competency: Use first aid

Tasks:
- Prepare and check a first aid kit for various occasions including:
  a. hiking
  b. skiing
  c. driving
- Check victim's consciousness
- Check for breathing
- Check for pulse
- Check for bleeding
- Use CPR
- Use a backboard
- Transport victim
- Obtain Red Cross or other recognized certification

Competency: Use wilderness survival techniques

Tasks:
- Identify treatment for hypothermia
- Construct a primitive shelter
- Construct crude snowshoes
- Signal an aircraft from the ground

III. Manage, Maintain and Protect the Resource.

Competency: Manage, construct and maintain facilities

Tasks:
- Plan and implement an SOEP, Coop or OJT work experience
- Develop a facility and grounds maintenance schedule
- Monitor and report facility and grounds maintenance needs
- Determine need for private contractors
- Estimate cost of services
- Maintain and repair water and sewer systems
- Maintain and repair structures and conveniences
- Maintain and repair typical park/campground facilities

Maintain grounds and recreation areas
Plan and construct facilities
Make electrical repairs
Form and pour concrete
Maintain roads, culverts and drainage ditches
Observe safety precautions

Competency: Maintain parks and recreation areas

Tasks: Interpret park campground rules and regulations to visitors or co-workers, and provide user information to the park or campground visitors
Maintain records and develop a plan of day-to-day operation and safety
Maintain:

a. canoe routes
b. cross-country ski trails
c. cycling trails
d. hiking trails
e. historic sites
f. horseback trails
g. scenic roads
h. skiing areas
i. snowmobile trails
j. swimming beaches
k. wayside rests

Competency: Protect visitors and park resources

Tasks: List the major liabilities and responsibilities of management for the protection of park resources and visitors
Post and maintain park directions and warnings
Post park rules and regulations
Administer emergency first aid
Recognize need for medical assistance
Develop plans to protect visitors from dangerous animals and other hazards
Develop plans to protect animals and plants and other resources from visitors
Monitor and supervise camping and fishing areas
Operate and maintain structural fire fighting equipment and tools
Operate and maintain wildland fire fighting equipment and tools
Construct and maintain wildfire protection lanes
Supervise and maintain park sanitation
Explain current fish and game laws
Record information concerning possible parks and recreation violations
Write a citation

Competency: Work with wildlife

Tasks: Practice ethical handling of wildlife
Use a live trap
Approach wildlife carefully
Carry a firearm
Radio tag wildlife
Transport wildlife safely
Use a tranquilizing gun

(A) Competency: Help plan recreational settings

Tasks:
- Identify and classify major soil types
- Read and interpret legal land descriptions
- Contrast visitor and natural resource (wildlife) carrying capacities of a recreational site
- Read and interpret maps, charts and aerial photographs
- Identify principles of recreation management as they relate to protecting the resource
- Help plan protected wetlands
- Explain the role of organizations such as sportsmen clubs or organizations like Ducks Unlimited in resource management
- Perform habitat improvement
- Cooperate with landowners in habitat improvement
- Encourage cities and boroughs to become involved in recreational planning
- Plan public access to recreational settings
- Develop nature study areas
- Protect shoreline habitat through zoning
- Contact legislators concerning planning areas or recreational development
- Assist in the development of land, wildlife and water resource conservation plans for recreational areas
- Develop private recreational areas
- Plan a private camping or picnic area
- Plan a private recreation lodge or cabin
- Assess developing a private game farm
- Assess the profitability of golf courses or other such recreational developments in Alaska
- Assess the profitability of other resorts in Alaska
- Assess the profitability of marinas in Alaska

Competency: Incorporate technical information into recreation site management practices

Tasks:
- Record scientific data
- Maintain a current file of technical information
- Analyze data relative to the operation
- Assess new practices, equipment and materials based on research or technical information
- Interpret technical information relative to occupations
- Participate in a wildlife count

IV. Define the Resource.

Competency: Name Alaska's park and recreation resources

Tasks:
- Identify national park areas in Alaska
- Identify state park areas in Alaska
- Identify national wildlife refuge areas in Alaska
- Identify national marine refuge areas in Alaska
- Identify federal wilderness areas in Alaska
- Identify Alaska's national forests
- Identify local recreational sites
- Identify Alaska's private recreation areas
- Identify national and state historic sites in Alaska
- Explain the recreational aspects of Alaska's natural resources

V. Understand the Importance of the Resource.

Competency: **Understand the importance of parks and recreation areas**

Tasks: Explain the importance of recreational opportunities in terms of:

a. scientific baseline
b. spiritual value
c. mental health
d. resources for the future
e. tourism
f. protecting lifestyles and heritage
g. physical health
h. artistic, literary, historical, and archaeological values
i. effects on the ecosystem
j. commercial enrichment
k. non-commercial enrichment
l. wilderness versus public access
m. leisure time use in the daily, weekly, monthly, and annual personal time budget

Identify major types of recreational setting including:

a. national parks
b. state parks
c. refuges
d. wilderness areas

Competency: **Predict trends in recreation site use**

Tasks: Estimate future population trends in recreation in Alaska
Estimate future trends in use of leisure time for Americans
Explain future demands on recreational use of natural resources in Alaska and ways to deal with such demands

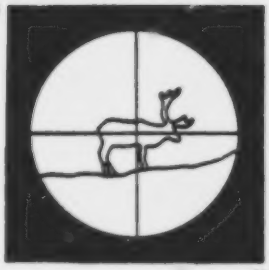
VI. Understand competing uses

Competency: **Understand controversies related to parks and recreation land use in Alaska**

Tasks: Compare and contrast public and private management and regulation of recreational settings
Define the D2 clause of ANSCA
Explain several sides of the parks and land use issue
Explain issues concerning mining in recreation settings
Explain the use of ATV's and aircraft for self-sufficiency
Explain the issue of:

a. Self-sufficiency hunting, trapping, and fishing in recreation settings
b. Sports hunting in parks and recreation areas
c. Designating Native allotment lands in parks and recreation areas
d. Sports versus commercial fishing in parks and recreation areas
e. Wilderness versus multiple use in parks and recreation areas

Self-Sufficiency



(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **Use skills for self-sufficiency**

Tasks: Perform tasks in producing food and fiber for personal use including:

a. hunting
b. fishing
c. gathering
d. preparing

Explain traditional roles of gathering in Native Alaskan cultures
Identify traditional roles of men and women in self-sufficiency in Native Alaskan cultures
Explain ways to barter or trade self-sufficiency resources
Identify work as:

a. animal handler
b. boat builder
c. carver
d. doll maker
e. farmer/gardener
f. fisherperson
g. food preparer
h. gatherer
i. house builder
j. hunter
k. skin sewer
l. tanner
m. trapper
n. weaver

II. Use the Resource.

A. Hunt.

Competency: **Understand means and methods of self-sufficiency hunting in Alaska**

0Tasks: Compare traditional versus contemporary means of hunting
Identify impacts of hunting on the overall resource base -- long term
Explain hunting techniquesby species
Appropriately choose weapons
Safely handle weapons
Practice safe hunting techniques
Explain and practice hunting ethics

Competency: **Hunt**

Tasks: Obtain state hunting license
Identify rules and regulations for area in which you wish to hunt
Identify state regulations for game for which you wish to hunt
Obtain game tags
Wear proper clothing for conditions
Carry first aid and survival gear
Operate and repair ATC, skiff, or other equipment used in hunting
Set up hunting camp as needed
Identify specifics of behavior of species hunted
Use appropriate hunting methods for species hunted

Use survival skills in the out-of-doors while hunting
Dress game in the field
Cover and preserve the harvest in the field (meat, hide/fur, hoofs, horns, antlers, etc.)
Transport the harvest

B. Trap.

Competency: **Understand means and methods of self-sufficiency trapping in Alaska**

Tasks:
Compare traditional versus contemporary means of self-sufficiency trapping
Identify impacts of trapping on the overall resource
Apply conservation and game management principles
Identify rules and regulations for hunting and trapping
Compare types of traps
Equip for trapping
Preserve and set baits
Care for and set traps
Skin animals
Tan skins
Market skins and hides
Cut out and design patterns on skins
Manage business records related to trapping

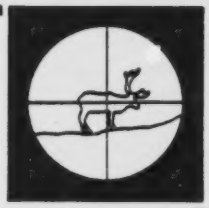
C. Gather.

Competency: **Understand means and methods of self-sufficiency gathering in Alaska**

Tasks
Equip a self-sufficiency gathering operation
Choose proper means of gathering
Compare types of devices for gathering
Gather safely
Clean material
Dry material
Use survival skills in the out-of-doors
Care for and store the products gathered

Competency: **Gather seafoods and shellfish from beaches**

Tasks:
Obtain proper tools and clothing for shellfish gathering
Gather shellfish on the beach
Explain the hazards of paralytic shellfish poisoning
Obtain proper tools and clothing for seaweed gathering
Gather seaweed
Wash seaweed
Cook, pickle, or preserve seaweed



Competency: **Gather and prepare wild medicinals**

Tasks:
Identify materials appropriate for medicinal purposes
Choose proper means of gathering
Equip for successful gathering
Differentiate between poisonous and non-poisonous plants
Care and store materials gathered
Use wild medicinals

D. Fish.

Competency: **Understand means and methods of self-sufficiency fishing in Alaska**

Tasks:
Care for the catch
Fish safely
Choose proper means of self-sufficiency fishing, abiding by state laws
Equip a self-sufficiency fishing operation
Safely survive in the out of doors
Construct fish nets
Use set nets
Use dip net
Eel fish with dip net
Mend torn nets
Construct fish wheel
Use a fish wheel
Safely operate boats
Troubleshoot outboard motor
Explain what to do if you fall overboard

*(For commercial fishing, see **Fishing and Fisheries** section)*

E. Farm for Self-Sufficiency.

Competency: **Prepare garden**

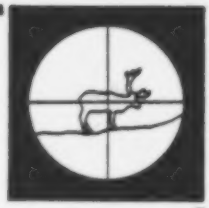
*(See **Vegetable and Fruit Production** and **Greenhouses** sections of curriculum)*

F. Process and Prepare Resources for Self-Sufficiency.

1. Prepare and Store Resources for Self-Sufficiency.

Competency: **Clean and prepare meat**

Tasks:
Confirm that the animal is dead
Prepare carcass according to species and/or traditional methods
Bleed animal (if applicable)
Gut animal
Dispose of entrails sanitarily
Bone, quarter and/or transport game according to:
a. size of animal
b. location of vehicle, plane or residence
c. products wanted (meat, hide, etc.)



Butcher meat
Wrap and freeze or dry meat
Distribute meat to family,relatives, friends or the community
Prepare and cook meat
Prepare skins, sinew and/or bone for self-sufficiency

Competency: Clean and prepare plants

Tasks:
Compare traditional versus contemporary means of wild plant preparation
Prepare plant items in the field
Prepare items at home
Gather and prepare seaweed
Choose recipe

Competency: Smoke foods

Tasks:
Cut and dry wood for smoker
Prepare meat or fish for smoking
Apply techniques for smoking
Store smoked foods

Competency: Can foods

Tasks:
Follow proper sanitary procedures while canning
Prepare foodstuff to be canned
Can plants/roots/berries, including:

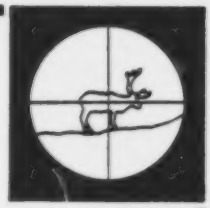
a. obtaining canning jars
b. preparing pressure cooker
c. cooking product
d. placing product in sterilized jars
e. cooling jars
f. sealing jars
g. storing jars

Competency: Dry foods

Tasks:
Air-dry fish
Dry fruits and/or vegetables
Use electric drier
Store dried foods

Competency: Construct ice cellar

Tasks:
Locate site for ice cellar
Dig cellar, steaming permafrost as needed
Scatter dirt
Reinforce cellar walls



Competency: Render seal oil

Tasks:
- Obtain seal
- Skin seal
- Remove fat and blubber from seal
- Chop fat and blubber into chunks
- Place fat and blubber in jars
- Scoop oil off jars
- Store oil in a cool place

Competency: Freeze foods

Tasks:
- Prepare foods for freezing
- Wrap foods in freezer wrap, foil or other protective covering
- Label foods
- Store in freezer, placing oldest foods in front or on top
- Determine necessary date of use of frozen products

2. Manufacture and Repair Technology for Self-Sufficiency.

Competency: Construct a summer camp

Tasks:
- Mark, fell, and notch logs for cabin
- Construct cabin floor
- Identify and cut packed snow for igloo
- Assemble snow blocks
- Construct sleeping platform
- Make and/or install stove
- Saw, split, and stack firewood
- Construct outhouse or toilet pit
- Safely store and discard unburnable refuse

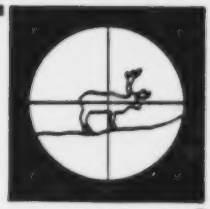
Competency: Construct a winter camp

Tasks:
- Choose camp site
- Purchase, haul, and set up tent(s) or construct cabin
- Secure fuel for lamps and stoves
- Purchase, haul, and set up tents
- Construct tent platform
- Make and/or install stove
- Saw, split, and stack firewood
- Construct outhouse or toilet pit
- Safely store and discard unburnable refuse

3. Utilize Transportation for Self-Sufficiency.

Competency: Maintain a dog team

Tasks:
- Train dogs to pull a sled
- Maintain good rapport with dogs
- Train dog leader
- Feed dogs
- Maintain dogs' health
- Construct and maintain dog yard



Recognize individual differences/skills per dog
Buy, sell, and/or trade dogs
Make dog harnesses
Make dog collars
Make dog booties

Competency: Construct a boat

Tasks:
Design boat
Obtain permits for timber, if necessary
Fell timber
Age timber
Saw boards
Form boards into boat form
Fasten boards
Caulk seams

Competency: Construct a sled

Tasks: Construct a sled for snowmachine

a. Select wood for sled
b. Steam and form runners
c. Form stanchions
d. Tie stanchions to runners
e. Form and tie handle bars and cross pieces
f. Steam top rail and place on sled
g. Place front plate on runners
h. Trim rails
i. Complete brush bow
j. Rig brakes
k. Oil sled
l. Install runners (shoes)
m. Trim bolts
n. Construct tow line

Construct a dog sled
(Tasks follow those for snowmachine sled . A dogsled is shorter and lighter.)

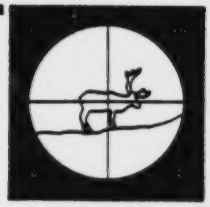
4. Manufacture Crafts for Sale (Traditional Arts)

Competency: Complete baskets

Tasks:
Sketch out basket before starting
Cure gathered material
Make baskets from material gathered
Decorate baskets
Market products made

Competency: Make items of bone or tusk

Tasks:
Sketch out product before starting
Carve ivory or bone from material gathered
Market products made



Competency: **Make items of fur and skin**

Tasks:
- Explain how to select skins
- Prepare hides
- Complete patterns
- Sew product
- Decorate product
- Make masks
- Sew mukluks
- Sew moccasins
- Sew parkas
- Market products made

Competency: **Make items of wood**

Tasks:
- Carve totems
- Carve and decorate dolls
- Market products made
- Compare traditional versus contemporary means of product exchange

G. Use Skills and Equipment for Self-Sufficiency.

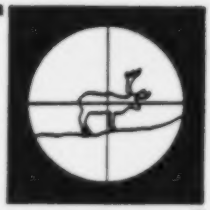
Competency: **Use wilderness survival techniques**

Tasks:
- Carry a survival kit
- Build an outdoor shelter
- Build a fire from scarce materials
- Recognize and obtain wild foods by:
  - a. making a snare
  - b. making a spear
  - c. identifying and gathering edible wild plants
- Construct a signaling device
- Explain the importance of a positive attitude in wilderness survival
- Make snowshoes
- Identify symptoms of and treatment for hypothermia

Competency: **Use tools for self-sufficiency**

Tasks: Use and maintain:

- a. axe
- b. saw
- c. skiff
- d. chain saw
- e. canoe
- f. kayak
- g. hunting knife
- h. auger
- i. hammer
- j. handsaw
- k. ice scoop
- l. ice auger
- m. rifle
- n. other tools as applicable



Competency: Build nets

Tasks:
- Build nets according to plan
- Obtain material for net building
- Determine web size for species to be fished
- Size nets
- Compensate for stretching to set knots

Competency: Operate an outboard motor

Tasks:
- Install outboard on boat
- Start outboard both with retractable and auxiliary ropes
- Change spark plugs
- Lift motor in shallow water
- Change propeller
- Hand-start motor using pull-rope

Competency: Operate an ATV

Tasks:
- Operate the vehicle safely
- Clean and change spark plugs
- Tow ATV trailer
- Troubleshoot generator

Competency: Operate snow machine

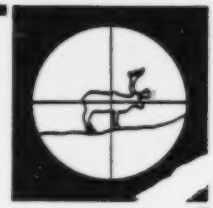
Tasks:
- Operate snow machine safely
- Operate snow machine at a safe speed
- Clean and change spark plugs
- Tow snow machine trailer

Competency: Troubleshoot a small engine

Tasks:
- Compare small engines of:
  - a. chainsaws
  - b. snowmachines
  - c. outboards
  - d. A/C generators
- Explain systematic approaches to troubleshooting engines and engine systems
- Check to see if engine is:
  - a. getting gas
  - b. getting spark
  - c. flooded
  - d. maintaining compression
- Correct above problems

Competency: Use rifle safely

Tasks:
- Never point rifle at human being
- Make sure rifle is unloaded when cleaning and transporting
- Check and double check
- Select correct ammunition
- Sight in rifle on a rifle range
- Break down and clean rifle safely, including:
  - a. always pointing weapon away from people
  - b. making doubly sure weapon is unloaded
  - c. cleaning barrel
  - d. cleaning trigger mechanism
  - e. running cleaning wads through weapon
  - f. oil and/or greasing weapon



Competency: **Set up and operate radio**

Tasks:
Carefully transport and store radio
Place antenna in proper alignment for transmission
Give location and all pertinent information when transmitting
Perform basic radio operation
Clean battery terminals
Install spare batteries
Key mike for emergency signalling

III. Manage and Protect the Resource.

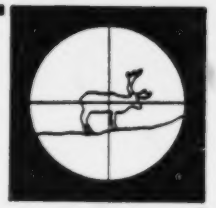
Competency: **Manage and protect self-sufficiency resources**

Tasks:
Identify state and federal self-sufficiency rules and regulations
Explain procedures for adopting and/or modifying such rules and regulations
Explain self-sufficiency ethics:
a. waste versus need
b. using all you take
c. leaving animals and plants to reproduce
d. animal suffering
e. minimizing human impact
f. packing out all refuse
g. minimizing resource damage
h. staying within carrying capacity of resource
Explain resource sustainability
Participate in local fish and game management and/or Native organization(s)
Identify work of agencies involved with self-sufficiency including:
a. Alaska Department of Fish and Game
b. Alaska Walrus Commission
c. Bureau of Land Management
d. U.S. Forest Service
e. National Park Service
f. Native corporations
g. Fisheries Advisory Board
h. U.S. Fish and Wildlife Service
i. International Whaling Commission
j. National Marine Fisheries

IV. Define the Resource.

Competency: **Understand self-sufficiency land use patterns and values of Alaska Native cultures**

Tasks:
Explain Alaska Native religious beliefs, including animism, the role of nature, and totems
Explain the role of natural occurrences, like fire, flood, and earthquakes
Explain the role of social interaction with neighboring societies, including the roles of trade and profit
Identify the roles of Native management organizations, especially Native and village corporations, the Alaska Eskimo Whaling Commission (AEWC), Eskimo Whaling Commission (EWC),Caribou, and the Rural Alaska Resources Association (RARA)



Competency: **Understand issues of land ownership and management**

Tasks: Explain land ownership and management issues related to:

a. Alaska statehood
b. Alaska Native Claims Settlement Act (ANCSA)
c. Alaska Native Interests Land Claims Act (ANILCA)
d. Bureau of Land Management (BLM)
e. Department of Agriculture
f. Department of the Interior
g. The Alaska purchase
h. Native and village corporations
i. Native allotments
j. Fish and Wildlife Service
k. State land selections

V. Understand the Importance of the Resource.

Competency: **Understand the importance of Alaska's resources used for self- sufficiency**

Tasks:
Explain the commercial value of Alaska's self-sufficiency resources
Explain the non-commercial value of Alaska's self-sufficiency resources
Explain aesthetic and human values represented by Alaska's self-sufficiency resources
Explain cultural values represented by Alaska's self-sufficiency resources
Explain the value of self-sufficiency resources in terms of stability of Alaskan ecosystems

Competency: **Understand the economic role of self-sufficiency in the Alaskan economy**

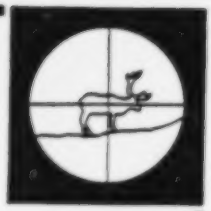
Tasks:
Describe the economic importance of self-sufficiency in the village economy
Describe the economic importance of viable village economies to the Alaska economy
Identify costs of self-sufficiency on the Alaska economy
Describe sharing and distribution networks

VI. Understand Competing Uses.

Competency: **Understand current competing uses of Alaska's self-sufficiency resources**

Tasks:
Explain Native versus non-Native uses of Alaska's self-sufficiency resources
Explain sports and commercial fishing versus self-sufficiency fishing
Explain the issue of international high seas fishing versus self-sufficiency fishing
Explain the issue of International Whaling Commission control of whaling
Explain the issue of state control of whaling

Competency: **Understand potential uses of Alaska's self-sufficiency resources**



Tasks: Explain under-utilized Alaskan self-sufficiency resources such as:

a. fresh water
b. bottom fish
c. peat
d. coal
e. berries
f. other wild edible plants

Wildlife Use and Management

(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **Identify wildlife employment and educational opportunities**

Tasks:
Identify educational and occupational opportunities
Locate resources for finding employment
Confer with prospective employers
Identify the work of:

a. biology technician
b. clerk selling firearms
c. clerk selling fishing and hunting equip.
d. equipment and facility maintenance
e. fish and game biologist
f. fish and wildlife enhancement tech.
g. Fish and Wildlife Protection Officer
h. Fish and Wildlife Service Officer
i. fish and wildlife technician
j. fishing guide
k. hunting guide
l. lab technician
m. meat-cutter for wild game
n. park ranger
o. park technician
p. taxidermist
q. trapper
r. wildlife management aide
s. wildlife mgt maintenance worker

II. Use the Resource.

Competency: **Use a firearm**

Tasks:
Demonstrate firearm safety
Use a shotgun
Use a high-powered rifle
Use a handgun
Clean firearms

Competency: **Work safely around aircraft**

Tasks:
Demonstrate safety around aircraft
Do not transport flammables in aircraft

Competency: **Cross-country ski and snow shoe**

Tasks:
Choose proper skis
Choose proper ski wax
Wear proper ski and snow shoe clothing
Select correct-sized skies and/or snow shoes
Carry first aid and survival equipment
Ski or snow-shoe with proper technique

Competencies: **Drive a three-wheeler**
Construct temporary camps
Drive a truck
Take photographs
Operate a boat
Sport Hunt for game
Tan sports-killed game

*Tasks for the above competencies may be found under the competencies in the **"Outdoor Recreation"** and **"Self-Sufficiency"** areas.*

Competency: **Guide hunters**

Tasks:
Obtain all necessary permits for business
Attain guiding area
Advertise the operation
Plan outings well before beginning of season
Purchase food and equipment
Obtain first aid certification
Complete proper paperwork for insurance purposes
Check clients for proper equipment
Transport clients
Model hunting and wilderness ethics for clients
Assist client with cleaning of game, guns, and equipment
Cooperate with local law enforcement and conservation officials

III. Manage and Protect the Resource.

Competency: **Perform general construction and maintenance duties**

Tasks:
Maintain and repair fences, gates and pens
Maintain paths, roads and grades
Maintain and repair waterways, ditches and culverts
Plan daily maintenance activities
Construct paths, walks and structures
Operate arc and oxy-acetylene welding equipment
Form and pour concrete
Maintain and repair facilities

Competency: **Use research techniques**

Tasks:
Apply research techniques to wildlife, plant and other land resources
Use a microscope
Use a hand lens
Record scientific data
Compile plant, soil, wildlife data
Record plant, soil, wildlife data
Make wildlife observations and keep records
Interpret scientific reports
Write scientific reports
Maintain a collection plot

Competency: **Use a natural history library**

Tasks:
- Use bird and fish identification books
- Use plant identification keys
- Look up state and federal regulations in library

Competency: **Work with wildlife**

Tasks:
- Explain ways to safely capture wildlife
- Explain post-mortem procedures
- Measure physiological indices
- Analyze scientific data
- Capture wildlife, including:
  - a. using an insect net
  - b. using a live trap
  - c. using anaesthesizer

Competency: **Maintain and improve wildlife habitat**

Tasks:
- Analyze habitat
- Identify human activities that will pollute or alter wildlife habitat
- Research laws to protect wildlife habitat
- Enhance habitat if applicable
- Work with controlled burns
- Work with villages to improve habitat
- Explain ethics and value of feeding animals
- Identify human wildlife problems related to human garbage and ways to remedy them
- Explain the issue of removing nuisance animals
- Analyze ways to improve and protect moose, caribou, and deer habitat

Competency: **Maintain and improve bird habitat**

Tasks:
- Explain physical and biological factors affecting bird habits
- Explain artificial rearing and releasing of birds
- Explain the purpose of bird banding
- Explain ways of improving habitat for birds
- Explain ways to take bird censuses by drumming counts
- Explain the importance of proper wetlands management

Competency: **Work with the public**

Tasks:
- Greet the visitor
- Inform visitors of rules and regulations
- Remind visitor of safety precautions
- Assist visitor with visit to wildlife area
- Know local language and customs

Competency: **Interpret natural resources to the public**

Tasks:
- Explain natural resources information to visitors
- Conduct a slide show
- Conduct a nature walk
- Answer informational requests over the phone

Competency: **Perform law enforcement**

Tasks:
Interpret fish and game laws
Identify courses of study for basic law enforcement
Contact fish and wildlife area users
Record wildlife violation information
Observe laws and regulations relative to the operation
Interpret laws and regulations regarding land use
Interpret and apply wildlife and plant laws and regulations
Write a citation

IV. Define the Resource.

Competency: **Understand basic principles of biology**

Tasks:
Describe the basic biology of cells
Explain important principles of organic chemistry
Explain basic anatomical systems

Competency: **Understand principles, definitions, and terms related to wildlife management**

Tasks:
Describe management of:
a. upland game
b. fur bearers
c. sea mammals
d. waterfowl

Competency: **Evaluate wildlife habitat**

Tasks:
Map habitat types using aerial photography
Field-check habitat typing
Assess relative values for various wildlife species
Identify man-made alterations that have changed habitat values and review potential impacts of proposed alterations

Competency: **Know wildlife populations**

Tasks:
Distinguish sex of wildlife specimens
Sample wildlife populations
Assemble data in appropriate report

Competency: **Know important wildlife quarry**

Tasks:
Identify local and regional game animals
Identify major local and regional fur bearers
Recognize and interpret wildlife game laws, rules and regulations
Identify species of wildlife common to Alaska and classify them as game, non-game, endangered, or threatened
Describe the characteristics of given wildlife populations
Evaluate, improve, and maintain the habitat and physical condition of selected wildlife species

Competency: **Know characteristics of birds**

Tasks: Explain:

a. pigmentation changes in birds
b. the molt process in birds
c. bird migrations
d. bird imprint behavior
e. bird sexual display behavior
f. bird breed parasitism
g. the process of egg production and incubation
h. the process of bird care of young

Competency: **Know bird populations**

Tasks: Identify:

a. bird species important to hunters
b. important game waterfowl
c. important upland game birds
d. birds of prey and explain laws relating to them
e. perching birds

Competency: **Know wild plants**

Tasks: Identify major plant life in a given area and its relationship to other resources
Name and identify habitats of endangered plant species in Alaska
Describe the characteristics of plant populations
Evaluate, improve, and maintain the habitat and physical condition of selected plant

Competency: **Mark or tag animals and plants for identification**

Tasks: Construct and erect signs
Capture and tag wildlife species
Observe areas for signs of wildlife and plant population shifts
Observe wildlife and plant life for diseases and pests

V. Understand the Importance of the Resource.

Competency: **Know animal characteristics and management factors**

Tasks: Explain:

a. carrying capacities
b. animal territorialism
c. the idea of harvestable surplus
d. the issue of predator control
e. an area's biotic potential
f. the relationship of sex ratios to wildlife populations
g. the relationship of hierarchy of predation on wildlife populations
h. seasonal variations in wildlife populations

Competency: **Plan wildlife management**

Tasks: Identify types of values of wildlife resources
Explain history of Alaska wildlife management
Identify the duties of the wildlife manager and wildlife biologist

Identify basic needs of wildlife
Explain how to manage wildlife by intensive and extensive methods
Protect vanishing species
Use field investigational techniques
Identify laws pertaining to wildlife in Alaska

Competency: **Apply scientific procedures and ideas basic to wildlife management**

Tasks:
Explain the scientific method
Use several different types of microscopes
Contrast biogenesis and spontaneous generation
Explain the biosynthesis of carbohydrates
Identify the parts of the cell
Make microscope slides
Differentiate cell behavior in different solutions
Compare photosynthesis and respiration
Describe the replication of DNA
Describe the phases of mitosis
Explain Mendel's Law of Segregation
Explain the theory of natural selection
Name important groupings of living things and the system of classification

VI. Understand Competing Uses.

Competency: **Understand issues related to wildlife management**

Tasks:
Explain:
a. ways to maintain and improve wildlife habitat
b. major difficulties in wildlife management
c. the management of preserves and refuges
d. problems and prospects of introducing exotic species
e. methods of keeping track of wildlife populations
f. ways of live capturing wildlife for study
g. management practices for moose, deer, wolves, bears, and caribou

Recognize ways to define wildlife range

IV
Course Descriptions

Course Descriptions

The brief course descriptions provide conceptual frameworks for educational planners that seek to design and implement a balanced program in Renewable Natural Resources/Agriculture. Teachers can use these descriptions to organize course offerings in a Renewable Natural Resources/Agriculture education program. These descriptions are examples of content organization and are too brief for purposes of program approval. Local schools will need to be much more definitive regarding the content of their courses than is reflected in these course descriptions.

Introduction to Renewable Natural Resources/Agriculture: A course that provides individuals an overview of land, air & water; forestry; fishing; outdoor recreation; self-sufficiency; wildlife; agriculture mechanics; animal science; plant science; horticulture; and soil science. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Introduction to Renewable Natural Resources: A course that provides an overview of renewable natural resources including world natural spheres, forces in the physical environment, systems in the living environment, and other ecological systems. The course includes instruction in the role of history, ethics, laws, economics, and land ownership on natural resources. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Introduction to Agriculture: A course providing an overview and introduction to agricultural mechanics, horticulture, animal science, soil science/agronomy, and plant science. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Agricultural Mechanics I: A course that prepares individuals to select, operate, maintain, service, sell and use agricultural power units, machinery and equipment. This course includes instruction in safety, use of hand and power tools, construction of agricultural facilities, and mechanical practices associated with farming and ranching. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Agricultural Mechanics II, III & IV: Courses which provide additional instruction in the use of hand and power tools and concentrate on the operation, maintenance and repair of small engines, equipment and tractors. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Horticulture I: A course that prepares individuals to produce, process and market plants, shrubs, and trees used principally for ornamental, recreational, and aesthetic purposes. The course also prepares individuals to establish, maintain, and manage horticultural enterprises in the areas of olericulture, floriculture, greenhouses, and ornamental horticulture. The course includes instruction in machinery and equipment necessary for each horticultural enterprise. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Horticulture II, III & IV: Courses which provide additional instruction in the horticultural processes of producing, processing, and marketing plants, shrubs and trees. These courses also concentrate on the management of horticultural enterprises. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Animal Science I: A course that includes the theories, principles, and application of appropriate technical skills that apply to the production and management of animals and animal products. This course includes instruction in animal health, diseases and feeding. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

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Animal Science II, III & IV: Courses which provide additional instruction in animal production. These courses concentrate on animal management and business aspects of the field. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Plant Science: A course that includes theories and principles of science and practices involved in the production and management of plants for food, feed, fiber,and soil conservation. The course involves instruction in plant structure, function, growth and reproduction. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Soil Science/Agronomy I: A course that includes content from the physical, chemical, and biological sciences. The course also includes basic principles relating to the determination of soil properties and their conservation and management for crop production, or other purposes. The course emphasizes principles and practices of the development, production, and management of field crops, including plant breeding, plant diseases, soils, insect control, and weed control. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Soil Science/Agronomy II, III & IV: Courses which provide additional instruction in production and management of field crops concentrating on aspects of the soil environment such as analyzing, conserving and managing soil. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Land, Air and Water Management I: A course that prepares individuals in the principles and practices used in the effective use and protection of land, air and water. The course includes instruction in reading maps; interpreting surveys and land status; testing soil, air, and water; treating air and water; evaluating odors; and protecting the resource. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Land, Air and Water Management II, III & IV: Courses that provide additional instruction in the principles and practices used in the effective use and protection of land, air and water. The courses include instruction in the nature and properities of soil, air and water. The courses include studying the importance of the resource as well as competing uses. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Forestry I: A course which prepares individuals to produce, protect, and manage timber and specialty forest crops. The course involves maintaining, operating, and repairing forestry equipment and machinery; harvesting and transporting trees and selecting, grading, and marketing forest raw materials for converting into a variety of consumer goods. The course incorporates utilizing the forest for multiple purposes such as game preserves and recreation. Additionally, the course covers instruction in safety; timber management techniques; timber harvesting techniques; use, maintenance and repair of equipment; protection of the resourse; fire control; and marketing. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Forestry II, III & IV: Courses which include additional instruction in the production, protection and management of the forest, concentrating on the varying roles of forestry. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Fishing & Fisheries I: A course which prepares individuals to engage in commercial fishing and to manage fish resources to optimize production. The course includes instruction in safety; seamanship skill;, gear building, handling, and maintenance; vessel operation and maintenance; meal preparation; fish handling and processing; fishing techniques; and management of the resource. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Fishing & Fisheries II, III & IV: Courses which provide additional instruction in fishing and managing fishing resources. These courses may include concentrated study on other aspects of the fisheries industry such as hatcheries or fish marketing. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Outdoor Recreation I: A course that prepares individuals to plan and maintain recreational facilities and programs of public or private agencies. The course includes instruction in park maintenance, handling wildlife and site management practices. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Outdoor Recreation II, III & IV: Courses that provide additional instruction in planning and maintaining recreational facilities. The courses concentrate on recreational site planning and site management practices including the incorporation of technical information into recreational site management. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Self-Sufficiency I: A course that prepares individuals to provide for all or part of their needs by securing and processing food and fiber for personal use. The course includes instruction in hunting, trapping, fishing, gathering, preparing, farming, storage and resource management. The course also involves construction, maintenance and repair of equipment used for self-sufficiency activities. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Self-Sufficiency II, III & IV: Courses that provide additional instruction in securing and processsing food and fiber for personal use , concentrating on the care and management of the resources. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

Wildlife Use and Management I: A course that prepares individuals in the principles and practices used in the production, harvesting and improvement of wildlife resources. The course includes instruction in safety, vehicle and boat operation, guide duties, general construction and maintenance, research techniques, habitat improvement, law enforement, wildlife biology, and wildlife management. ***Length:*** *One year or one semester* ***Grades:*** *9-12*

Wildlife Use and Management II, III & IV: Courses that provide additional instruction in the principles and practices used in the production, harvesting and improvement of wildlife resources. The courses concentrate on applying scientific procedures to wildlife management and understanding the competing issues related to wildlife management. ***Length:*** *One year or one semester each* ***Grades:*** *9-12*

V
Curriculum Analysis Matrices

Curriculum Analysis Matrices

Identified Competencies by Course Offerings

This competency checklist should be used by teachers in identifying competencies to be included in specific classes in Renewable Natural Resources/Agriculture education. This checklist is a curriculum analysis tool for use by teachers in assigning responsibilities for the competencies of a total Renewable Natural Resources/Agriculture education program. All courses taught in the Renewable Natural Resources/Agriculture education program are identified in the columns at the top of the matrix. The individual competencies can be allocated to specific courses. One method for analyzing the competency list is to assign letters where the competency will be introduced (I), taught (T), or mastered (M). Curriculum sequences can be organized through this approach.

To assist teachers to reinforce basic skills instruction, competencies have been cross-referenced with the following academic areas:

Math (M)	Science (S)
Social Studies (SS)	Language Arts (LA)

This will assist local school districts in awarding cross-credit (academic credit) for participation in vocational classes they deem appropriate. The following checklists are also cross-referenced with pre-employment competencies and student leadership competencies. The Job Training Partnership Act provides funds to train economically disadvantaged youth to enter and succeed in employment. Each Private Industry Council responsible for administering these funds adopted youth pre-employment competencies as one of the measures for positive termination for program participants. The other measures are attained through unsubsidized employment, or through another training program.

The following categories of work-related knowledge must be evaluated and measured in the course of a participant's enrollment in a JTPA program:

1. **Pre-Employment Competencies**, which require the participant to demonstrate the skills and knowledge necessary to identify career objectives, seek and obtain employment and understand job performance.

2. **Work Maturity Competencies**, which require the participant to demonstrate the ability to apply skills in a training position.

3. **Educational Skills Competencies**, which require the participant to demonstrate basic computation and communication skills necessary to enter the labor market.

4. **Occupational Skills Competencies**, which require the participant demonstrate proficiency in those skills necessary to maintain employment in a specific occupation or occupational cluster.

The pre-employment and work maturity competencies have been specifically cross-referenced in this curriculum so that natural resource instructors could specify where these competencies are integrated into the curriculum. **Student leadership programs are designed to be an integral part of the curriculum.** The competencies are reinforced by student participation in approved student organizations such as Future Farmers of America (FFA). The student leadership competencies have been cross-referenced in this handbook to assist the natural resource instructor in identifying specifically where these competencies will be taught.

FUTURE FARMERS OF AMERICA (FFA)

Future Farmers of America (FFA) is for students enrolled in secondary and postsecondary vocational courses in natural resources and agriculture. Through planned chapter activities, FFA develops the "whole" student, social and leadership abilities as well as vocational skills. The FFA motto is:

Living to Serve

Learning to Do

Doing to Learn

Earning to Live

Organized Instruction (Classroom, and Lab)
Supervised Occupational Experience Coop, or OJT
FFA Activities
(Vocational Student Leadership Organization)

Major components of the Natural Resources/ Agriculture Program

FFA's term "agriculture" refers to what is, for this curriculum, "Renewable Natural Resources/Agriculture." FFA's aims and purposes are:

1. To develop competent and aggressive agricultural leadership.

2. To create and nurture a love of country life.

3. To strengthen the confidence of students of vocational agriculture in themselves and their work.

4. To create more interest in the intelligent choice of agricultural occupations.

5. To encourage members in the development of individual occupational experience programs and establishment in agricultural careers.

6. To encourage members to improve the home and its surroundings.

7. To participate in worthy undertakings for the improvement of the industry of agriculture.

8. To develop character, train for useful citizenship and foster patriotism.

9. To participate in cooperative effort.

10. To encourage and practice thrift.

11. To encourage improvement in scholarship.

KEY

M Math
S Science
LA Language Arts
SS Social Studies
*** Pre-Employment Competencies**
+ Student Leadership Competencies

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

	LEADERSHIP/CITIZENSHIP						
* +	Understand leadership						
LA * +	Use effective leadership skills						
SS +	Use parliamentary procedure						
* +	Demonstrate initiative and productivity						
* +	Demonstrate work maturity						
* +	Be honest						
* +	Be reliable and dependable						
LA * +	Solve problems						
* +	Be assertive						
* +	Maintain good personal relations						
LA * +	Follow verbal and written directions						
* +	Deal effectively with clients						
* +	Understand how to be an entrepreneur						
	Employability Skills						
S *	Work safely						
S *	Prevent work-related injuries						
SS *	Follow OSHA guidelines						
S *	Maintain good health for effective job performance						
SS *	Identify personal responsibilities related to employment						
LA * +	Identify career choices						
S,SS +	Identify jobs in renewable natural resources/agriculture						

Identify course title(s) here.

	Recommended Competencies by Course Offerings **Competencies**						
LA * +	Prepare a resume and job application						
LA * +	Write a cover letter						
LA * +	Prepare for an interview						
LA *	Follow up the interview						
* +	Understand employee rights and responsibilities						
LA *	Identify proper job resignation procedures						
	INTRODUCTION TO NATURAL RESOURCES						
	I. What studying natural resources can and cannot do for you.						
LA ,SS * +	Recognize employment opportunities in natural resources						
	II. An overview of natural resources.						
S,SS	Define terms related to natural resources						
S	Define the major world natural spheres						
S	Define major forces in the physical environment						
S	Define important systems in the living environment						
S	Define the role of water resources in natural systems						
S	Define ecological systems in streams, lakes, bays, and inlets						
S	Apply ecological principles						
S	Define the role of plant and animal succession in the natural world						
SS, S	Define important communities in the natural world						
SS,S	List Alaska's important natural resources						
	III. History and ethics.						
SS, LA	Understand the pre-contact human interaction with natural resources						

Identify course title(s) here.

	Recommended Competencies by Course Offerings **Competencies**						
SS,LA	Understand pre-contact human ethics related to natural resources						
SS,LA	Understand expansion-era human ethics related to natural resources						
SS,LA	Understand Russian-era human ethics related to natural resources in Alaska						
SS,LA	Understand the human interaction with natural resources in Alaska from purchase to statehood						
SS,LA	Understand human ethics related to natural resources in Alaska from purchase to statehood						
S,SS LA	Understand human interaction with natural resources in Alaska from statehood to present						
S,SS LA	Understand human ethics related to natural resources in Alaska statehood to present						
M,SS LA	Understand the role of humans in resource issues						
SS,LA	Understand the management of public lands						
SS,LA	Contrast rural and urban relationships						
S,SS	Understand the importance of planning in proper resource management						
S,SS LA	Understand principles of conservation						
S,SS, LA	Understand the conservation movement in the U.S.						
SS, LA	Understand major social and economic factors concerning conservation						
S	Understand human effects on streams and lakes						
S,SS	Understand technological impacts of highways						
S	Understand how to control hazardous wastes						
	IV. Laws, economics, and land ownership.						
S, SS, LA	Understand laws related to Alaska's natural resources						
SS, LA	Understand issues related to land ownership and management						
SS, LA	Understand economics related to natural resources						

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

	Agricultural Mechanics I:						
S	Maintain shop safety						
S, M	Use hand tools						
S, M	Use power tools						
S	Use ropes effectively						
S, M	Perform basic drafting procedures						
	Agricultural Mechanics II:						
S, M, LA	Use service and repair manuals						
M,LA	Order parts, supplies, equipment and services						
M,LA	Maintain maintenance and service records						
LA, S	Operate an agricultural wheel-type tractor						
S, M	Arc weld						
S, M	Oxy-acetylene cut and weld						
S, M	Maintain and service lubrication system						
	Agricultural Mechanics III:						
S, M	Perform general shop tasks						
S, M	Perform basic wiring						
S, M, LA	Operate and service small motors						
S, M, LA	Operate and service small gasoline engines						
S, M	Perform more advanced arc welds						
S, M	Mig weld						
S, M	Tig weld						

Identify course title(s) here.

	Recommended Competencies by Course Offerings **Competencies**						
S, LA	Operate an agricultural wheel-type tractor under field conditions						
S, M	Identify equipment requirements						
S	Operate agricultural field equipment						
S, M	Adjust and repair agricultural equipment						
S, M	Maintain and service fuel system						
S, M	Maintain and service brake systems						
S, M	Troubleshoot gas and diesel power units						
S, M	Maintain and service the ignition system						
	Agricultural Mechanics IV:						
S, M	Service manual transmissions and differentials						
S	Maintain and service clutches						
S, M, LA	Maintain and service electrical system accessories						
	Animal Science I:						
S, LA	Understand principles and terms related to animal science						
S, M, LA	Select animals						
	Animal Science II:						
S	Understand animal health principles and common diseases						
S, M, LA	Feed animals						
	Animal Science III & IV:						
S, M, LA	Manage animals						
	PLANT SCIENCE						
	Plant structure, function, growth, and reproduction						

Identify course title(s) here.

	Recommended Competencies by Course Offerings Competencies						
S	Recognize basic parts of plants and their functions						
S	Recognize plants by growth habits						
	Plant Taxonomy						
S, M	Use plant keys						
S, M	Classify plants						
	Plant Environment						
S, M	Understand the nature and properties of soils						
S	Understand influences of moisture, light, temperature, and air						
S, M	Understand how to control plant growth						
	Plant Health						
S	Understand characterisics of a healthy plant						
S	Understand environmental factors causing plant disorder						
	Soil Science/Agronomy I:						
S	Understand the function of soils						
	Soil Science/Agronomy II:						
S, M	Understand physical and chemical properties of soil						
	Soil Science/Agronomy III:						
S	Understand properties of the soil profile						
M,LA	Understand land capability						
S, M	Use soil surveys						
S, LA	Utilize land descriptions						
	Soil Science/Agronomy IV:						

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**								
S	Use soil conservation and management techniques							
S, M	Test soil							
	HORTICULTURE							
	Ornamental Horticulture							
S	Understand terms and definitions related to ornamental horticulture							
SS *	List types of ornamental horticulture businesses							
S	Identify parts of plants							
S	Classify, identify and determine the functional uses of ornamental plant materials							
SS,LA	Value attractive lawns and turf							
S,SS	Understand state and federal regulations related to the operation of a horticulture business							
M,LA	Prepare a landscape plan							
S, M	Understand the role of soil fertility in ornamental horticulture							
S, M	Prepare a site for landscaping							
S	Use specific tools in planting							
S,M	Operate and maintain lawn maintenance equipment safely							
S, M	Prepare growing media and seedbeds							
S	Handle plants upon arrival							
S	Plant shrubs and trees							
S, M	Plant and maintain turf							
S	Maintain landscape site							
S,M	Apply fertilizer							
S, M	Control pests and diseases							

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**							
S	Prune ornamentals						
S, M	Irrigate ornamentals						
S, M	Handle packing, temporarily storing, and unpacking of plants						
S, M LA	Harvest and market nursery stock						
S	Perform special ornamental management practices						
S, M	Irrigate ornamental plants						
S, M LA	Design a lawn maintenance plan						
S, M LA	Design and install interior plantscaping						
S, M	Consider special characteristics of Alaska's climate						
	Floriculture						
S	Define terms and principles of floriculture						
S, M LA	Plan the floriculture venture						
S, M	Prepare the growing medium						
S	Propagate plants						
S, M	Manage the crop						
S, M	Perform special management practices						
S	Use special harvest methods						
S	Design with flowers and foliage						
LA *	Sell products						
	Vegetable and Fruit Production (Olericulture)						
S, M	Define basic olericulture terms and techniques						
S	Assess the potential for personal use and commercial agriculture						

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

S, M	Plan the operation						
S, M	Prepare the growing medium						
S, M	Plant crops						
S, M	Manage crop production						
S	Control pests and diseases						
S, M	Harvest crops						
	Greenhouses						
S, M	Understand principles of greenhouse management						
S, M	Plan, construct, and maintain greenhouse physical facility						
S, M	Identify, select, operate, and maintain greenhouse equipment						
S, M	Control greenhouse environment						
S, M	Produce greenhouse crops						
	LAND, AIR AND WATER						
	I. Work with the Resource.						
SS *	List employment and educational opportunities in fields related to land, air, and water						
	II. Use the Resource.						
	A. Read maps, surveys and determine land status.						
M, SS	Use a map projection						
S, M	Use a compass						
SS, M	Interpret maps						
M	Measure horizontal distances						
M	Measure vertical distances						

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**							
M	Measure angles						
M	Record surveying data						
M *	Assist surveyor						
SS,LA	Determine land status						
	B. Test soil.						
S, M	Test soil						
	C. Test water.						
S, M	Test and treat water						
S, M	Meet drinking water standards and abide by regulations						
S	Produce potable water						
S, M	Complete calculations and measurements in hydraulics						
S,SS	Understand water use laws in Alaska						
	D. Test air.						
S, M	Understand components of the atmosphere						
S,M	Sample gases for ambient particulate level						
S, M	Evaluate sources of combustion						
S, M	(A) Select and install air pollution sampling equipment						
S, M	Record and analyze particulate and gaseous sampler data						
S, M	Understand the effects of topography and weather on air pollution						
S,M	Evaluate odors						
S, M	Test noise						

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

	III. Manage and Protect the Resource.						
S	Protect land resources						
S, M	Protect water resources						
S, M	Protect air resources						
	IV. Define the Resource.						
S	Understand the nature and properties of soil and soil formation						
S	Understand components of air and their role						
S	Understand components of water						
	V. Understand the Importance of the Resource.						
S,SS	Understand the importance of land resources						
S,SS	Understand the importance of water resources						
S	Understand the importance of air resources						
	VI. Understand competing uses.						
S,SS	Understand human-caused problems associated with land, air, and water						
S,SS	Understand the effects of air polluting particulates and gases						
S, M, SS	Understand acid rain concerns						
S, M SS	Understand effects of thermal pollution on lakes and streams						
S	Identify effects of water-polluting substances						
S,SS	Understand impacts of power generation						
	FISHING AND FISHERIES						
	I. Work with the Resource.						
SS *	Identify employment and educational opportunities in fishing and fisheries						

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

	II. Use the Resource.						
	A. Safety						
S	Practice personal safety and accident prevention						
S, M	Use boating safety and seamanship skills						
	B. Seamanship.						
S, M	Use a tide book, nautical charts, and coast pilot						
S, M	Check out and get a vessel underway						
S, M	Maneuver a vessel						
S, M	Use the rules of the road						
S, M	Use modern electronic systems						
S, M	Use marine lights and sound signals						
SS	Get along with other members of crew						
S, M	Anchor vessel						
S, M	Dock a vessel						
	C. Building, handling, and maintaining gear.						
S, M	Build, mend and repair nets and lines						
S, M	Operate and maintain gear hydraulics						
S, M	Maintain and operate processing equipment						
	D. Vessel operation and maintenance.						
S	Conduct deckhand duties						
S, M	Maintain vessels						
S	Prevent marine corrosion problems						

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**							
S	(A) Repair engine problems						
	E. Other duties and skills.						
S, M LA	Prepare meals aboard the vessel						
M, LA	(A) Maintain and analyze records related to fishing						
M, LA	(A) Secure loans from bank and state agencies						
M	(A) Compute the tax liabilities of a fisherman						
	F. On-board fish handling.						
S	Understand the importance of fish quality						
S, M	Handle fish correctly aboard the vessel						
S	Practice vessel sanitation						
S	Store fish aboard the fishing vessel						
	G. Marine Products Processing.						
S	Process fish						
S, LA	Handle and process marine products						
S, M	Maintain fish quality during storage and shipping						
S	Sanitize seafood plant						
	H. Actively fish.						
S, M	Net fish						
S	Line fish						
S, M	Pot and trawl fish						
M	(A) Analyze economic factors related to a mariculture venture						
M, LA	(A) Plan and implement mariculture venture, SOEP, Coop or OJT						

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**							
S	(A) Locate feasible mariculture site						
S, M	(A) Construct and maintain mariculture site						
S, M	(A) Stock and maintain species in cages						
S	(A) Harvest mariculture fish and/or material						
S, M	(A) Increase production as feasible						
	III. Manage and Protect the Resource.						
SS,LA	Understand the important state and federal regulations and regulatory agencies pertaining to fisheries						
SS,LA	Understand the important state and federal regulations and regulatory agencies pertaining to navigation						
S, M LA	Understand fish management practices						
S,LA	(A) Define important factors for hatchery placement						
S, M	Define important hatchery techniques						
S, M	Work in a hatchery						
S, M	Care for fish in a hatchery						
S, M	Manage salmon						
	IV. Define the Resource.						
S	Understand Alaska's water resources						
S	Identify attributes of Alaska's commercial fish species						
S	Understand the life cycles of Pacific salmon						
	V. Understand the Importance of the Resource.						
SS, S M	Understand the economic importance of fishing to Alaska						
SS, LA	Understand the traditional importance of fishing to Alaska						
SS	Understand the international importance of fishing to Alaska						

Identify course title(s) here.

	Recommended Competencies by Course Offerings **Competencies**						
	VI. Understand competing uses.						
S,SS	Understand the role of fisheries management						
S,SS	Identify forces competing for Alaska's fishery resources						
	FORESTRY, PRODUCTION AND PROCESSING						
	I. Work with the Resource.						
M,LA *	Understand employment and educational opportunities in forestry management, production, and processing						
	II. Use the Resource.						
S,LA	Understand timber management techniques						
S,LA	Understand timber harvesting techniques (basics of silviculture)						
S, M	Complete a rough land survey						
S, M	Measure a stand (cruise timber)						
S, M	Scale logs						
M	Survey roads						
S *	Use an axe						
S *	Use a chain saw						
	III. Manage and Protect the Resource.						
S, M	Improve stands						
S	Control undesirable brush and weeds						
S	Reforest						
S	Manage insects						
S	Control forest diseases						
S	Understand principles of fire ecology						

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**							
S	Understand basic tenets of wildland fire control						
S, M	Understand fire behavior						
S	Use the pulaski, fire rakes, and fire shovels						
S	Set up pumps						
S, M	Lay hose						
S, M	Control fires						
S	Control other dangers to forests						
	IV. Define the Resource.						
S	Understand major principles of botany						
S	Understand main principles of forest ecology						
S, M	Understand types of soils and uses						
S	List parts of trees and shrubs						
S	Understand stages of commercial timber stand development						
S	Identify major commercial hardwood and softwood species						
S, LA	List types and geographic area of trees (and identify economic potential) for different parts of Alaska						
S, LA	List forest users and management services						
	V. Understand the Importance of the Resource.						
S,SS LA	Identify the role of forestry products						
SS,LA	Understand various roles of forestry						
	VI. Understand competing uses.						
S,SS LA	Understand competing uses of Alaskan forests						

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

	OUTDOOR RECREATION						
	I. Work with the Resource.						
SS,LA *	Understand employment and educational opportunities in parks and outdoor recreation						
	II. Use the Resource.						
	A. Work with People.						
LA *	Manage visitor services						
SS,LA	Speak a second language						
	B. Use Outdoor Recreation Equipment.						
S, M	Operate and maintain equipment and tools						
S, M	Take photographs and/or assist visitors in doing so						
S	Drive a truck or bus						
S	Drive a three-wheeler, four wheeler or other ATC						
S	Use a firearm						
S	Operate a boat						
S	Work safely around aircraft						
LA	Sell books, film, and curios						
M	Operate a cash register						
	C. Work Out-of-Doors.						
S	Backpack						
S	Hike						
S	Cross-country ski						
S	Construct temporary camps						

Identify course title(s) here.

	Recommended Competencies by Course Offerings **Competencies**						
	D. Understand the Out-of-Doors.						
S, M	Manage flora and fauna						
S	Observe wildlife						
	E. Use First Aid and Survival Skills.						
S, M	Use first aid						
S,LA	Use wilderness survival techniques						
	III. Manage, Maintain and Protect the Resource.						
S,LA	Manage, construct and maintain facilities						
S	Maintain parks and recreation areas						
S, M, SS	Protect visitors and park resources						
S, M	Work with wildlife						
S, M, LA	**(A)** Help plan recreational settings						
SS, LA	Incorporate technical information into recreation site management practices						
	IV. Define the Resource						
M,SS	Name Alaska's park and recreation resources						
	V. Understand the Importance of the Resource.						
M,SS	Understand the importance of parks and recreation areas						
S,SS LA	Predict trends in parks and recreation use						
	VI. Understand competing uses						
S,SS	Understand controversies related to parks and recreation land use in Alaska.						

Identify course title(s) here.

Recommended Competencies by Course Offerings

Competencies

	SELF-SUFFICIENCY						
	I. Work with the Resource.						
S,SS	Use skills for self-sufficiency						
	II. Use the Resource:						
	A. Hunt.						
S, SS	Understand means and methods of self-sufficiency hunting in Alaska						
S	Hunt						
	B. Trap.						
S, M	Understand means and methods of self-sufficiency trapping in Alaska						
	C. Gather.						
S	Understand means and methods of self-sufficiency gathering in Alaska						
S	Gather and store seafoods and shellfish from beaches						
S	Gather and prepare wild medicinals						
	D. Fish.						
S	Understand means and methods of self-sufficiency fishing in Alaska						
	E. Farm for Self-Sufficiency.						
S	Prepare garden						
	F. Process and Prepare Resources Self-Sufficiency .						
	1. Prepare and Store Resources for Self-Sufficiency.						
S	Clean and prepare meat						
S	Clean and prepare plants						
S	Smoke foods						

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**								
S	Can foods							
S	Dry foods							
S, M	Construct ice cellar							
S	Render seal oil							
S, M	Freeze foods							
	2. Manufacture and Repair Technology for Self-Sufficiency.							
S,SS	Construct a summer camp							
S, SS	Construct a winter camp							
	3. Utilize Transportation for Self-Sufficiency							
S	Maintain a dog team							
S	Construct a boat							
S, M	Construct a sled							
	5. Manufacture Crafts for Sale.							
S,SS	Complete baskets							
S,SS	Make items of bone or tusk							
S,SS	Make items of fur and skin							
S,SS	Make items of wood							
	G. Use Skills and Equipment for Self-Sufficiency.							
S	Use wilderness survival techniques							
S,SS	Use tools for self-sufficiency							
S, M	Build nets							
S	Operate an outboard motor							

Identify course title(s) here.

Recommended Competencies by Course Offerings **Competencies**							
S	Operate an ATV						
S	Operate snow machine						
S	Troubleshoot a small engine						
SS	Use rifle safely						
SS,LA	Set up and operate radio						
	III. Manage and Protect the Resource.						
SS,LA	Manage and protect self-sufficiency resources						
	IV. Define the Resource.						
SS,LA	Understand self-sufficiency land use patterns and values of Native American cultures						
SS,LA	Understand issues of land ownership and management						
	V. Understand the Importance of the Resource.						
SS,LA	Understand the importance of Alaska's resources used for self-sufficiency						
M,SS, LA	Understand the role of self-sufficiency in the Alaskan economy						
	VI. Understand competing uses.						
SS,LA	Understand current competing uses of Alaska's self-sufficiency resources						
SS, LA	Understand potential uses of Alaska's self-sufficiency resources						
	WILDLIFE						
	I. Work with the Resource.						
SS,LA *	Identify employment and educational opportnities related to wildlife						
	II. Use the Resource.						
S	Use a firearm						
S, LA	Work safely around aircraft						

Identify course title(s) here.

Recommended Competencies by Course Offerings Competencies							
S	Cross-country ski and snow shoe						
S	Drive a three-wheeler						
S	Construct temporary camps						
S, M	Drive a truck						
S, M	Take photographs						
S	Operate a boat						
S	Backpack and/or camp out						
S	Sports hunt for game						
S	Tan sports-killed game						
LA, S	Guide hunters						
	III. Manage and Protect the Resource.						
S, M	Perform general construction and maintenance duties						
S, M LA	Use research techniques						
S,LA	Use a natural history library						
S, M	Work with wildlife						
S, M, LA	Maintain and improve wildlife habitat						
S, M, LA	Maintain and improve bird habitat						
SS,LA	Work with the public						
SS,LA	Interpret natural resources to the public						
M,LA	Perform law enforcement						
	IV. Define the Resource.						
S	Understand basic principles of biology						

Identify course title(s) here.

	Recommended Competencies by Course Offerings **Competencies**						
SS,LA	Understand principles, definitions, and terms related to wildlife management						
S	Evaluate wildlife habitat						
S, M	Know wildlife populations						
S, M	Know important wildlife quarry						
S	Know characteristics of birds						
S, M	Know bird populations						
S, M	Know wild plants						
S	Mark or tag animals and plants for identification						
	V. Understand the Importance of the Resource.						
S, M	Know animal characteristics and management factors						
S,LA	Plan wildlife management						
S	Apply scientific procedures and ideas basic to wildlife management						
	VI. Understand competing uses.						
S,M,SS LA	Understand issues related to wildlife management						

VI
Sample Skills Card

Sample Skills Card

This section of the guide provides teachers with an example of an instrument for evaluating the effectiveness of instruction. The skills record allows teachers to assess competency at four levels of proficiency. Teachers are encouraged to construct their own skills performance record using the competency lists in the curriculum section of this guide.

Instructions for Use

The list of vocational skills/traits was developed from a task analysis of a natural resource competency.

LEVEL CODE KEY:

1 Introductory Level: Can do simple parts of task. Needs to be told/shown how to do most of the task. Needs extremely close supervision.

2 Minimum Level: Can do most parts of the task. Needs help only with most difficult parts. Needs close supervision.

3 Average Level: Can do all parts of task. Needs only spot-check of completed work. Meets local demands for speed and accuracy. Needs moderate job entry supervision.

4 Proficiency Level: Can complete task quickly and accurately. Can direct others in how to do the task. Needs little supervision.

DIRECTIONS: The instructor/employer may write, date and initial in appropriate square.

Competency: Understand leadership

Tasks:

1	2	3	4	
				Attain self-worth by:
				a. working in committees
				b. defining self-esteem and explaining its importance
				c. practicing eye contact
				d. greeting others with a firm handshake
				e. using presentation skills
				Refine social skills
				Refine communications skills

Comments:

VII
Suggested Resources

Suggested Resources

The first section has been characterized by media type to facilitate teacher use: resource libraries, publishers of texts and instructional materials, state resources, associations, periodicals, special books/pamphlets, media, and materials suppliers. The second section is organized according to units. They are not necessarily duplicates.

The Alaska Department of Education has not formally reviewed nor approved all the resources listed in this section. Teachers are encouraged to preview materials before using them in the classroom and/or personally contact teachers of similar disciplines for recommendation regarding resources.

Resources by Type of Resource

Resource Libraries

Alaska Vocational Materials Library
Office of Adult and Vocational Education
Alaska State Department of Education
Box F
Juneau, AK 99811
(907) 465-2980

- Alaska Energy Education Series
- Appropriate Technology for Alaskans
- Basic Skills For The Trades
- Building in the North
- Choices & Challenges: A Young Man's and Teen Woman's Journal for Self-Awareness and Personal Planning
- Cooperative Education and On-The-Job Training Handbook
- Home-Based Business Resources
- Industrial Education Curriculum
- Industrial Education Resources
- Local Advisory Committee: Handbook for Vocational Administrators
- Pre-Employment Competencies Resource Guide
- Safety and School Shop Planning
- STARS: Secondary Training For Alaska
- Vocational Education Administration Handbook

The Library maintains curricula for all vocational areas. Resources are loaned for a 2 month review period. There are also many materials which may be purchased from the Library's special collections. Some materials are available free of charge.

The Library's catalog is computerized and may be operated on an Apple Computer using Appleworks Software. The catalog may be obtained by sending $10.00 (please make your check payable to the South East Regional Resource Center) or by sending five blank disks for duplication.

Alaska Career Information System
Office of Adult and Vocational Education
Alaska Department of Education
Box F
Juneau, AK 99811
(907) 465-2980

- Comprehensive career guidance system developed by Alaskans and for Alaskans seeking occupational and educational opportunities in and out of Alaska.

Alaska Department of Fish and Game
Library
333 Raspberry Road
Anchorage, AK 99518
(907) 267-2306

- Computerized reference listing of general interest publications, technical publications, research and other fish and game resources. (see PTL Pamphlet). *Excellent resource for non-game resources.*

Publishers

Alaskabooks
P.O. Box 1494
Juneau, AK 99802
(907) 586-3067

Alaska Fieldbooks Co., Ltd.
P.O. Box 1044
Anchorage, AK 99510
(907) 274-5742

Ken Cook Company
9929 West Silver Spring Road
Milwaukee, WI 53225
(414) 466-6060

Delmar Publishers
2 Computer Dr. West
Albany, NY 12212
Excellent Textbooks

Fairmont Press, Inc.
700 Indian Trail
Liburn, GA 30247
(404) 925-9388

Glencoe Publishing Co.
Bennett and McKnight Division
15319 Chatsworth Street
Mission Hills, CA 91345

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

Harper and Row Publishers, Inc.
10 East 53rd Street
New York, NY 10022
(212) 207-7099

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
Excellent Source

Houghton Mifflin Publishing Co.
777 California Ave.
Palo Alto, CA 94304

National Farm Book Company
P.O. Box 206-5149 Highway T
Amherst, Wisconsin 54406
Listing of Agriculture books

National Textbook Company
4255 W. Touhy Ave.
Lincolnwood, IL 60646-1975
(312) 679-5500

Prakken Publications, Inc.
P.O. Box 8623
Ann Arbor, MI 46107
(313) 769-1211

Prentice-Hall Publishing Co.
Box 1050
Mt. Kisco, NY 10549

South-Western Publishing Co.
5101 Madison Road
Cincinnati, OH 45227

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
Excellent Source of Inexpensive Items Request Free Catalog

Technical Publishing
1301 South Grove Ave.
P.O. Box 1030
Barrington, IL 60010
(312) 381-1840

Timber Press
P.O. Box 1632
Beaverton, OR 97075
800-323-4900

VGM Career Books
Division of National Textbook Co.
4255 West Touhy Ave.
Lincolnwood, IL 60646

John Wiley and Sons, Inc
605 Third Ave.
New York, NY 10016
(212) 207-7099

State Resources

Alaska Dept. of Education
Box F
Juneau, Alaska 99811

- Village Alaska
- Stock, Corporations, and the Native Land Claims Settlement

Alaska Energy Library
Alaska Department of Community and Regional Affairs
949 E. 36th Street, Suite 403
Anchorage, AK 99508

- References, maps, greenhouse construction and other energy related materials

Alaska Health Sciences Library
3211 Providence Drive
Anchorage, AK 99508

- Journals and magazines in the area of job Safety and health

Alaska Resources Library
U.S. Department of Interior
Bureau of Land Management
701 C Street
Box 36
Anchorage, AK 99513
(907) 271-5025

- Information center to assist in serious research involving natural resources in Alaska. Provides computer searches and interlibrary.

Alaska State Film Library
West International Airport Road
Anchorage, AK 99518
(907) 561-1132

- Films and videos on agriculture, horticulture and greenhouse construction and management
- "Animal Migrations" (#34886)
- "Animal World-Polar Bear" (#40289)
- "Bear Country" (#30516)
- "Caribou Crisis, Eskimo Perspective" (#84457)
- "Caribou, a Human Problem- What to do with Tongass Deer" (#44149)
- "Caribou Hunting At The Crossing Place" (#44194)
- "Eskimo Changing Culture" (#33482)
- "Eskimo Hunters" (#30288)
- "Eskimo Tarpon (Sheefish)" (#33482)
- "Fur Seals of the Pribilofs" (#44024)
- "People of the Yukon Delta" (#40278)
- "Return of the Muskox" (#84414)
- "Salmon, Life Cycle of a Sockeye" (#12671)
- "Seal Island" (#42285)
- "She Bristol Bay Story" (#54014)
- "There is No More Fish" (#84283)
- "The Story of Pink Salmon" (44107)
- "The Warm Coat" (#24008)
- "The Web of Life- The Living Tundra" (#44293)

Biomedical Library
901 Koyukuk Avenue South
Fairbanks, AK 99701

- Books on job health hazards and hazardous materials

National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, OH 43210

- Vocational Education Curriculum Materials database of all 50 states.

Northwestern Vocational Curriculum Coordination Center
St. Martin's College
Lacey, WA 98503

- 10-State regional library of vocational materials. Can be accessed through the Alaska Vocational Materials Library.

Alaska Department of Environmental Conservation P.O. Box O Juneau, AK 99811 (907) 465-2600/Pub. Information (907) 465-2621/Library	• Materials on pollution, oil spills, hazardous waste regulations for specific pollution type problems • Provides information on the handling, transportation and disposal of hazardous waste materials
Alaska Department of Fish and Game P.O. Box 3-2000 Juneau, AK 99802 (907) 465-4112	• Provides free information, training and inspections • Alaska Wildlife Week • Project Wild
Alaska Department of Labor Occupational Safety and Health Section P.O. Box 7-022 Anchorage, AK 99501	• Provides free information, training and inspections
Alaska, University of Institute of Agricultural Sciences Fairbanks, AK 99701 Also: University of Alaska Extension Service and College of Human and Rural Development	• Creating A Northern Agriculture • Publications on agricultural development in Alaska. *Should have all these on the reference shelf.* • Catalog of publications on many Alaska resources • Seaweek Curriculum. Publications on teaching in rural and cross-cultural settings.
Anchorage Center for Economic Education School of Business and Public Affairs University of Alaska Anchorage, AK 99508 (907) 786-1770	• Lending library of films and filmstrips: "The Big E's, The Climber, More Economics and The Global Society, The Economics of Energy, Economics and The Environment, The Economics of Public Utility Enterprise, The economics of Pollution, The Economics of the Energy Problem, and The Economics of Oceans"
Arizona Center for Vocational Education Box 6025 Flagstaff, AZ 86011 (602) 523-5442	• "Forestry Aid Curriculum for Native Americans"
California Department of Education 721 Capitol Mall Sacramento, CA 95814-4785	• Boating The Right Way • Ekistics: Guide for Interdiciplinary Environmental Curriculum
California Polytechnic State University Vocational Education Productions San Luis Obispo, CA 93407 Excellent Source	• Agricultural Mechanics • Back Pocket Guide to Ornamental Plants • Basic Pruning Techniques • Dairy Handbook • Experiments in Soil Science • Growing Container Plants • Landscaping Design • Nursery Management and Practices • Propagating Ornamental Plants • Terrariums And How To Make Them
Center for Occupational Research and Development 601 C Lake Air Dr. Waco, TX 76710 (817) 772-8756	• Occupational cluster learning packages for Agriculture/Agribusiness

Curriculum and Instructional Materials Center(CIMC) 1500 W Seventh Stillwater, OK 74074-4364	• Agriculture Department Filing System • Agricultural Mechanics • Basic Horticulture • Farm Business Management • Horticulture Identification and Judging • Range and Forage Plants • Tool Identification • Vocational Agriculture I,II,III,IV
Curriculum Coordinating Unit Drawer DX Mississippi State University Mississippi State, MS 39762	• A Guide for Teaching Basic Agriculture • A Guide for Teaching Ag Products and Supplies/Services • Agricultural Mechanics Instruction • A Reference for Liming Soils for Greater Profit • A Reference on Vegetable Production • Basic Principles of Plant Science
Curriculum Development Unit Office of Vocational Education 2024 Capital Plaza Tower Frankfort, KY 40601	• Agribusiness Curriculum: 14 modules and instructor manual for horticulture, gardening and groundskeeping Excellent Materials
Curriculum Materials Service Vocational Education Building Colorado State University Ft. Collins, CO 80523	• Laboratory Activities in Horticulture
Curriculum Publications Clearinghouse Western Illinois University Horrabin Hall 46 Macomb, IL 61455 (309) 298-1917	• Agricultural Program Planning Guides • Vocational-Technical Education Consortium of States (V-TECS) Catalogs of Performance, Objectives and Curriculum Materials for Agriculture/Agribusiness Occupations
Iowa Association for Vocational Instructional Materials 208 Davidson Hall Iowa State University Ames, IA 50011 (515) 294-6673	• Planting a Tree or Shrub • Soil and Water Conservation • Wildlife-A Product of the Land
Continuing Education Publications P.O. Box 1491 Portland, OR 97207	• Horticulture: Deciduous Trees • Horticulture Equipment Operation and Maintenance • Horticulture: Evergreen Trees and Shrubs • Horticulture: Insects and Diseases • Horticulture Mechanics • Identification and Control of Insects, Diseases, and Other Plant Pests • Introduction To Landscape and Nursery Management • Landscape Maintenance • Ornamental Plant Identification • Plant Propagation • Weed Identification and Control

Illinois State Board of Education
Adult, Vocational and Technical Education
Research and Development Section
E-426
100 N First St.
Springfield, IL 62777
(217) 782-4620

- Agricultural Occupations
- Competency-Based Horticulture: Turfgrass Maintenance Worker and Gardening-Groundskeeping

Instructional Materials Laboratory
10 Industrial Education Bldg.
University of Missouri-Columbia
Columbia, MO 65211
(314) 882-2883
Outstanding Source

- Catalog of materials on agribusiness, agricultural management and mechanics, agricultural science, diseases and pests and horticulture

Instructional Materials Service
Cornell University
24 Roberts Hall
Ithaca, NY 14853-5901
(607) 255-3002
Outstanding Source

- Catalog of resources and instructional materials on agriculture business, farm production and management, ornamental horticulture and agricultural mechanization
- Conservation and Forestry Materials

Instructional Materials Service
Agriculture Education
Texas A & M University
College Station, TX 77843-2588
(409) 845-6001
Outstanding Source

- Agricultural Mechanics
- Greenhouse Management and Operation
- Catalog of materials on agriculture

Instructional Materials Service
Agricultural and Extension Education Department
101 Rolfs Hall
University of Florida
Gainesville, FL 32611

- Crop Production Resource Guide
- Horticultural Materials

Kansas Vocational Curriculum
Dissemination Center
Room 116, Willard Hall
Pittsburg State University
Pittsburg, KS 66762-9987
(316) 231-7000

- Horticulture I,II,III
- Vocational Agriculture I,II,III,IV
- Vocational Ag Mechanics

Maryland Vocational Curriculum
Research and Development Center
Department of Industrial Education
University of Maryland
College Park, MD 20742

- Horticulture Nursery Instructional Guide
- Resource Guide to Competency-Based Vocational Education: Agriculture

Mid-America Vocational Curriculum Center
1500 W Seventh Ave
Stillwater, OK 74074-4364
(405) 377-2000

- Employment in Agribusiness
- Microcomputer Applications in Agriculture
- Horticulture Curriculum
- Agricultural Production Curriculum
- Agricultural Mechanics Curriculum

New Mexico State Department of Education
Vocational-Technical Division
Santa Fe, NM 87503

- Horticulture I: A Curriculum Manual

Ohio Agricultural Education Curriculum Materials Service, Room 254 2120 Fyffe Road Ohio State University Columbus, OH 43210-1099 (614) 422-4848 *Outstanding Source*	• Catalog of slides, software and printed resources on horticulture, natural resources, forestry, agricultural production, agribusiness, and argicultural mechanics.
Ohio State University Ohio Career Education and Curriculum Management Lab in Agricultural Education Columbus, OH 43210	• Career Preparation in Environmental Protection: A Curriculum Guide • Catalog of Slides, Software Natural Resources, Forestry, Agricultural Production, Agribusiness, and Agricultural Mechanics.
Oregon Career Development Consortium Marion Education Service District 651 High St. NE, Suite 4 Salem, OR 97301	• Basic Skills in Vocational Education: Computer Skills, Mathematics, Reading, Speaking/Listening and Writing
Oregon Department of Education Division of Vocational Education 700 Pringle Parkway SE Salem, OR 97310-0290	• Forestry/Forest Products: Subject Matter Update 1986-87 • Individual Learning Systems: Forest Technology, Forest Products
Pennsylvania Flower Growers 103 Tyson Building University Park, PA 16802	• Bedding Plants: A Penn State Manual Excellent Reference Inquire about other titles
Superintendent of Public Instruction Commission for Vocational Education Old Capitol Bldg Olympia, WA 98504	• Greenhouse Management • Nursery Production • Ornamental Horticulture • Plant Propagation • Turf Grass Management • Vegetable Gardening: A Curriculum Guide to be Used in Conducting Programs for Handicapped Students
Virginia Vocational Curriculum Center 2200 Mountain Rd. Glen Allen, VA 23060	• Planning and Implementing a Competency-Based Special Agriculture Program
Vocational Agriculture Service University of Illinois 1401 S Maryland Dr. Urbana IL 61801	• Catalog of materials on agricultural business, economics, mechanics, horticulture and plant and soil science
Vocational Education Media Center 10 Tillman Hall Clemson University Clemson, SC 29631 Excellent Source	• Agriculture Electricity • Agriculture Mechanics • Agriculture Production and Business Management • Exploring Agriculture • Gardening and Groundskeeping • Greenhouse Production • Small Gasoline Engines • Tractor Mechanics

Vocational Occupational Information Center for Educators (VOICE)
721 Capitol Mall
Sacramento, CA 95814

- Learning Activity Packets for Vocational Agriculture
- Record Keeping System

Vocational Studies Center
University of Wisconsin-Madison
964 Educational Sciences Bldg.
1025 W Johnson St.
Madison, WI 53706

- Tools, Equipment and Machinery: Adapted for Vocational Education and the Employment of Handicapped People
- Urban Soil and Water Management

Associations

Alaska Natural Resource and Outdoor Education Association (ANROE)
Box 110536
Anchorage, AK 99511-0536

- Flyways, Pathways, Waterways
- Provides networking for natural resources educators, disseminates curriculum trains teachers in curriculum use, and provides and information clearinghouse

Agriculture Council of America
1250 Eye St. NW Suite 601
Washington, DC 20005
(202) 682-9200

- "The Forum Newsletter"
- Provides research and educational materials

The Alaska Federation of Natives (AFN)
411 West Fourth Ave., Suite 301
Anchorage, AK 99501

- Information on Native land claims

The Alaska Native Foundation
P.O. Box 100278
Anchorage, AK 99501

- Information on Native land claims
- Alaska Native Land Claims, by Robert Arnold
- Workbook for Alaska Native Land Claims
- To Have and to Hold Land Resources
- Trouble Ahead

Alaska Women in Timber (AWIT)
111 Stedman Street #200
Ketchikan, Alaska 99901

- Alaska's Great Green Forest, an educational program for students in grades 4-6. (Free for Alaska teachers; $5.00 for out-of-state teachers)

American Association of Nursery Men
230 Southern Building
Washington, D.C. 20005

- Organization for ornamental horticulturists.

American Forestry Association
1319 18th St. NW
Washington, D.C. 20036

- Periodical - "American Forests"
- Publisher of seven books

American Vocational Association
1410 King St.
Alexandria, VA 22314

- Instructional materials for agriculture education
- Applying Pesticides

Brooklyn Botanical Garden Society
1000 Washington Ave
Brooklyn, NY 11225

- Brooklyn Botanical Garden Handbooks

Communicating for Agriculture
101 E Lincoln Ave
Fergus Falls, MN 56537
(218) 739-3241

- Working for Rural America
- Promotes health, well-being and advancement of people in agriculture and agribusiness. Sponsors international agriculture exchange program and presents scholarship awards.

Fertilizer Institute
1015 18th St. NW
Washington, DC 20036
(202) 861-4900

- "Fertilizer Financial Facts"
- "Fertilizer Flash Report"
- "Fertilizer Index"
- "Fertilizer Progress"
- "Our Land and It's Care"

Horticulture Awareness Association
14575 Mercury Dr.
Grand Haven, MI 49417
(616) 846-3864

- "Hort-News"
- Maintains library of research and educational materials, designs, general planting, growing information and landscaping catalog

Horticulture Research Institute and
American Association of Nurserymen
1250 I Street NW Suite 500
Washington, DC 20005
(202) 789-2900
Excellent

- "Journal of Environmental Horticulture"
- "UPDATE Newsletter"
- Maintains information on sources of plants and supplies. Publishes special research reports, manuals, handbooks, and other information Catalog Available

Industrial Biotechnology Association
1625 K St. NW, Suite 1100
Washington, DC 20006

- Seeds of Success: Biotechnology and Agriculture
- What Is Biotechnology?

National Alliance of Independent
Crop Consultants
949 Turner Quay
Jupiter, FL 33458
(305) 746-3740

- Research in crop management practices and techniques.

Society of American Foresters
5400 Grosvenor Lane
Bethesda, MD 20814

- "Journal of Forestry"
- Up-to-date technical information
- Annual conferences and convention
- Approves forestry programs at postsecondary schools and universities nationwide

Periodicals

Alaska, University of
Cooperative Extension Service
The Potting Bench
303 Tanana Dr.
Fairbanks, Alaska 99701

- "Horticulture"

Agricultural & Forestry Experiment Station
School of Agriculture & Land
Resources Management
University of Alaska - Fairbanks
Fairbanks, AK 99775-0100

- All areas of Alaskan Agriculture
- "Agroborealis"

Agriculture Education Magazine
RD 2 P.O. Box 639
Halifax, PA 17032

- "Agriculture Education"

American Horticultural Society
P.O. Box 0105
Mount Vernon, VA 22121
(703) 768-5700

- "American Horticulturist"
- North American Horticulture Reference Guide

American Nurseryman Publishing Co.
111 N. Canal St., Suite 545
Chicago, IL 60606
(312) 782-5505

- "American Nurseryman"

American Simmental Association
1 Simmental Way
Bozeman, MT 59715
1-800-548-0205

- Beef teaching aids for classroom or field
  Breeder associations are important

American Society of Agricultural Engineers
2950 Niles Road
St. Joseph, MI 49085

- Agricultural Engineering

The Alaska I.P.M. Scout
Cooperative Extension Service
University of Alaska
303 Tanana Dr.
Fairbanks, AK 99701

- Pests & Pest Control

American Society of Agronomy
677 S. Segoe Rd.
Madison, WI 53711
(608) 274-1212

- "Agronomy Journal"
- "Agronomy News"
- Crops and Soils
- "Journal of Agronomic Education"
- "Journal of Environmental Quality"

Floral & Nursery Times
328 Linden Avenue
Wilmette, IL 60091

- "Florticulture"
- "Nursery"

Business Publishers, Inc.
951 Pershing Dr.
Silver Spring, MD 20910-4464

- "Air/Water Pollution Report"
- "Ecology USA"
- "Ground Water Monitor"
- "Hazardous Waste News"
- "Toxic Materials News"

BW Roxburgh
Suite 907 151 Slater St.
Ottawa, Ont. KH4 SH4
Canada

- "Agrologist"

Creative Educational Video, Inc.
5147-A 69th Street
Lubbock, Texas 79424
(806) 794-3582

- Broadcast quality specialized agricultural videotapes for improved training

Elsevier Scientific Publications, Co.
52 Vanderbilt Ave.
New York, NY 10017

- "Agriculture and Environment"

Farmers Digest, Inc.
2645 Maple Hill Lane
Brookfield, WI 53005

- "Farm Digest"

Farm Journal, Inc.
230 W Washington Square
Philadelphia, PA 19106

- "Farm Journal"

Future Farmers of America 5632 Mount Vernon Highway Alexandria, VA 22309-0160	• "The National Future Farmer"
Geo. J. Ball, Inc. P.O. Box 800 West Chicago, IL 60185	• Grower Talks • Ball Red Book Excellent
Horticulture Associates 755 Boylston St. Boston, MA 02116 (617) 247-4100	• "Horticulture: The Magazine of American Gardening"
Institute for Alternative Agriculture 9200 Edmonston Rd., Suite 117 Greenbelt, MD 20770 (301) 441-8777	• "Alternative Agriculture News" • "American Journal of Alternative Agriculture"
International Harvester Co. 401 N Michigan Ave. Chicago, IL 60611	• "IH Forum"
Intertec Publishing Corp. Box 12910 Overland Park, KS 66212 (913) 888-4664	• "Grounds Maintenance"
Longman Group Journals Division 43 Annandale St. Edinburgh EH74AT Scotland	• "Animal Production"
Meister Publishing Co. 37841 Euclid Ave Willoughby, OH 44094 (216) 942-2000	• "Ag Consultant and Fieldman" • "American Fruit Grower" • "American Vegetable Grower"
Meredith Publications Corp. 1716 Locust St. Des Moines, IA 50303	• "Farm Computer News" • "Successful Farming"
Mid-America Publishing Co. 4251 Pennsylvania Ave. Kansas City, MO 64111	• "Flower and Garden Magazine" Inexpensive *Easy To Read*
National 4-H Council 7100 Connecticut Ave. Chevy Chase, MD 20815 (301) 656-9000	• "National 4-H News" • Many 4-H Project Books Contain ideas for SOEP projects & Lab. Activities
National Young Farmer Educational Association 303 Seventh St. Vandalia, IL 62471 (618) 283-4475	• "National Young Farmer" • "Young Farmer Update"

The Public Press, Ltd.
1760 Ellice Ave.
Winnipeg, Man. R3H QB6 Canada

- "Country Guide: The Farm Magazine"

Rodale Press
33 E Minor St.
Emmaus, PA 18049
(215) 967-5171

- "Organic Gardening"

Special Books/Pamphlets

Alaska Division of Agriculture
P.O. Box 949
Palmer, AK 99645

- "Alaskan Annual Farm Report"

AgriData Resources, Inc.
330 E. Kilbourn Ave.
Milwaukee, WI 53202
(414) 278-7676

- "AgriData Network:" Agricultural Information and Computing Network

University of Alaska, Fairbanks
Alaska Sea Grant College Program
Attorney's Plaza, Suite 1A
Fairbanks, AK 99775
Contact Sydney Stephens

- "Alaska Sea/River Week Curriculum Guides"
- "The Attached Solar Greenhouse Factsheet"

Conserva, Inc.
401 Oberlin Road, Suite 112
Raleigh, NC 27605

- Handbook for Implementing Improved Vocational Agriculture/Agribusiness Programs in Urban Areas

Cooperative Extension Service
University of Alaska, Fairbanks
303 Tanana Dr.
Fairbanks, AK 99701
(907) 452-1548
Should have all these on reference shelf

- Resources on agriculture and resource development including agricultural, domestic animals and animal products, commercial and farm structures and machinery, land economics, soil water and climatology, pest control, pesticide and fertilizer residues, home gardening, soils and additives, culture pest control and agricultural chemicals, greenhouses, landscaping planning, materials and culture

Doane Information Services
11701 Borman Dr.
St. Louis, MO 63146

- "Farm Management Guide" with Teacher Manual and Student Workbook
Good Reference

E.C. Geiger
Box 285, Rt. 63
Harleysville, PA 19438

- Everything For The Grower Catalog for Commercial Greenhouses

Federal Crop Insurance Corp.
U.S. Department of Agriculture
Washington, D C 20250

- Provides crop insurance for major crops. Protects against loss caused by natural perils.

Galahad Publishing
5124 S. 3245 W.
Salt Lake City, UT 84118

- "Backyard Vegetable Gardening"

Garden Way Publishing Schoolhouse Rd. Pownal, VT 05261 (802) 823-5811	• "Hints for the Vegetable Gardener"
Halycon Press of Ithaca 111 Halycon Hill Road Ithaca, NY 14850	• "Greenhouse Management" Excellent Reference
Interstate Printers and Publishers, Inc. P.O. Box 50 Danville, IL 61834-0050 (217) 446-0500	• "Flower and Plant Production in the Greenhouse" • "The Greenhouse Growers" • "Greenhouse Management for Flower and Plant Management" • Western Fertilizer Handbook • Many other agricultural publications
John Muir Publications P.O. Box 613-BG Santa Fe, NM 87501	• The Bountiful Solar Greenhouse • The Food and Heat Producing Solar Greenhouse
Lord and Burnham Division Burnham Corp. Irvington-on-Hudson, NY 10533	• Handbook for Greenhouse Gardeners
National Center for Appropriate Technology P.O. Box 3838 Butte, MT 59701	• Low-Cost Passive Solar Greenhouses, A Design and Construction Guide
Ortho Books Chevron Chemical Company 575 Market St. San Francisco, CA 94105	• How to Build and Use Greenhouses • The Facts of Light About Indoor Gardening Many other excellent books; request catalog.
Ohio Agricultural Research & Development Center (OARDC). Research-Extension Analytic Lab Hayden Hall Gerlaugh Dr. Wooster, OH 44691	• Soil Tests OARDC has many useful bulletins on many areas of agriculture
Rodale Press 33 E. Minor St. Emmaus, PA 18049	• The Solar Greenhouse Book
Running Press 38 S. Nineteenth St. Philadelphia, PA 19103	• The Handmade Greenhouse from Windowsill to Backyard
Soil Conservation Service U.S. Department of Agriculture Washington, DC 20250	• Provides technical advice to help small farmers find solutions to problems of soil erosion, clean water and barren land that has been surface-mined. Also provides soil surveys to aid in planning farming and conservation actions. *Request catalog of publications*

Sunset Books
Lane Publishing Company
Menlo Park, CA 94025

- Greenhouse Gardening
- How to Grow Bulbs
- How to Grow Houseplants

Swallow Publications
P.O. Drawer 10
Ville Platte, CA 70536
(318) 363-2139

- How to Identify Plants

Thomson Publications
P.O. Box 50160
Indianapolis, IN 46250

- Tree, Turf and Ornamental Pesticide Guide

Time-Life Books
Silver Burdett Co.
250 James St.
Morristown, NJ 07960

- Bulbs
- Flowering House Plants
- Lawn and Ground Covers
  Many other titles

U.S. Department of Agriculture
Farmers Home Administration
Washington, DC 20250

- Provides farm loans

U.S. Department of Agriculture
Office of Governmental and Public Affairs
Washington, DC 20250
(202) 447-2791

- Facts sheets, publications and bulletins for all agricultural areas. *Request catalog*

U.S. Department of Interior
Bureau of Land Management
701 C ST.
Box 13
Anchorage, AK 99513

- Manages public land and leases public land for livestock grazing

Media

Agricultural Education Curriculum
2120 Fyffe Road
Columbus, OH 43210

American Angus Assoc.
Materials Service
3201 Frederick Blvd. (good films)
St. Joseph, MO 64501

American Association for Vocational
Instructional Materials (AAVIM)
120 Driftmeir Engineering Center
Athens, GA 30602

American Quarter Horse Assoc.
P.O. Box 200
Amarillo, TX 79168
Good films

Brodhead-Garrett Co.
4560 E. 71st St.
Cleveland, OH 44105

National Audiovisual Center
8700 Edgeworth Dr.
Capitol Heights, MD 20743-3701

National Innovative Media Co.
Route #2, Box 301 B
Calhoun, KY 42327

Pictures, Inc.
811 W. 8th Ave.
Anchorage, AK 99501-3495

Instructional Materials Service
Cornell University, 24 Roberts hall
Ithaca, NY 14853-5901

Prentice-Hall Media
150 White Plains Rd
Tarrytown, NY 10591

Simulators, Inc.
1366-70 Ruan St.
Philadelphia, PA 19124

Career Aids, Inc.
20417 Nordhoff St.
Chatsworth, CA 91311

Computer Software Resources
AAVIM
120 Driftmier Engineering Center
Athens, GA 30602

Crop Data Management Systems
1521 Butte House Road, Suite B
Yuba City, CA 95991

The Farm Film Foundation
Suite 424 Southern Bldg.
1425 H St. NW
Washington, DC 20005

Modern Talking Picture Service, Inc.
5000 Park St. N
St. Petersburg , FL 33709
Outstanding source of films,
Free Loan Service

Toro Irrigation Division
5825 Jasmine St.
Riverside, CA 92504

Teaching Aids, Inc.
P.O. Box 1798
Costa Mesa, CA 92628-0798

Venard Films, Ltd.
Box 1332
Peroia, IL 61654

Vocational Education Media Center
10 Tillman Hall
Clemson University
Clemson, SC 29631

Vocational Education Productions
Cal Poly State University
San Luis Obispo, CA 93407

Materials Suppliers

Alaska, University of, Cooperative Extension
University of Alaska
Fairbanks, AK 99775-5200

George J. Ball, Inc.
P.O. Box 335
West Chicago, IL 60185

Bloomin' Greenhouse, Inc.
7591 Wilson Blvd.
Jacksonville, FL 32210

Burpee Gardens Agricultural
Warminster, PA 18974

Carolina Biological Supply Company
2700 York Road
Burlington, North Carolina 27215

Chevron Chemical Co.
Ortho Consumer Affairs - Ortho Films
P.O. Box 7144
San Francisco, CA
Excellent free films

Larry Connor, PhD
Beekeeping Education Service
P.O. Box 817L
Cheshire, Connecticut 06410-0817

A.H. Hummert Seed Co.
2746 Chouteau Avenue
St. Louis, Missouri 63103
Attn: Order Department

Indoor Garden Supplies
P.O. Box 40567
Detroit, MI 48240
Lamotte Chemical Products, Co.
P.O. Box 329
Chestertown, MD 21620

J.M McConkey and Co. Inc.
P.O. Box 309
Sumner, WA 983909-0309
Greenhouse supplies

Mellingers, Inc.
2310 W. South Range Road
North Lima, OH 44452-9731

NASCO West
1524 Princeton Avenue
Madesto, CA 95352
Supplies and book for everything in Ag.

Northern Hydraulics, Inc.
P.O. Box 1499
Burnsville, MN 55337

Cornell Instructional Materials Service
Daryle Foster, Director
Cornell University
Ithaca, NY 14850

Florists Publishing Company
310 South Michigan Avenue
Chicago, IL 50504

E.C. Geiger
Box 285 rt. 63
Harleysville, PA 19438
Greenhouse supplies

Goldblatt Tool Co.
511 Osage
Kansas City, KS 66110

Park Seed Co.
Cokesbury Road
Greenwood, SC 29647-0001

Satco, Division of Saterlee
924 S. 19th Ave.
Minneapolis, MN 55404

Scavengers Science Education Supplies
P.O. Box 211328
Auke Bay, AK 99802
A "must" for anyone teaching Nat Res

Technovate, Inc.
910 SW 12th Ave
Pompano Beach, FL 33060

Turner Equipment Co., Inc.
Hwy 117 South
Goldsboro, NC 27530

SUGGESTED RESOURCES BY UNIT

Leadership, SOEP, COOP, and OJT

Future Farmers of America
Box 15160
Alexandria, VA 22309

- FFA Advisor's Handbook
- Chapter Guide to FFA Activities
- Proficiency Awards
- International Study Opportunities (WEA)
- What is FFA? (Pamphlet)
- Leaders for the New Fields of Agriculture (Pamphlet)
- Official FFA Manual 1980 Vocational FFA Agriculture

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- SOEP Record & Record Summary Package
- FFA & Vo AG Record Summary and Analysis
- SOEP Enterprise & Record Book
- SOEP Sample Program & Key Apple II series computers
- Parliamentary Procedure & FFA Review, (Hobar), Apple II series computers, TRS 80 III,4
- Basic Lesson for Parliamentary Procedure Instruction. Complete lesson plans 63 page loose--leaf manual
- Supervised Occupational Experience (SOE) Programs Manual
- Leveling & Land Measurement Practices for AG. Two-manual series-Student Activity Manual and Instructor's Reference Manual
- Minnesota Vo AG Enterprises , A computer Record-keeping package for Minnesota SOE Programs, Apple II series computers or Apple III in II emulation-

- Iowa Vo AG Enterprises, A computer record keeping package for Iowa SOE Programs Apple II series computers

The Department of Agricultural Education
Iowa State University
Ames, Iowa
For beginning Vocational Agriculture Students

- An Instructional Packet on Leadership/FFA

Natural Resources

Arctic Environmental information and Data Center (A.E.I.D.C.)
Anchorage, AK

- Use of the Sea by Alaska Natives--A Historical Perspective.

Alaska Center for the Environment
700 H St. #4
Anchorage, AK 99501

- Environmental group. Deals with hazardous wastes.

Alaska, University of--Fairbanks
School of Agriculture-Land Resources Management
301 O'Neill Resources Building
Fairbanks, AK 99775-0100

- State FFA Center ; Handbook, Bibliography of Forest, material, Who's Planning Alaska, Instructional materials on Alaska Gardening and Root Cellaring

Available thru:
UAF library (and probably other libraries around the state)
Also:
Alaska Native Education
P.O. Box 1250
Fairbanks, AK 99707

- Natural Resources Management
  Includes units on:
  Regional Corporations
  Maps: Tools of Resource Managers
  Subsistence Resources Issues
  Land-Wildlife Resources
  Forest Resources
  Fisheries Resources
  Water Resources
  Energy Resources
  Tourism Resources

A self-paced introduction of Alaska native students focusing on regional corporation responsibilities. Computerized. (Commodore)

Alaska SEA Grant College Program
University of Alaska-Fairbanks
UAF-Fairbanks, 99701
Excellent source of activities. Several different guides are available.

- Alaska SEA Week Curriculum Series

Alaska State Film Library
650 W. International Airport Road
Anchorage, AK 99815

- Videos on ANSCA: "Common Ground", "Losing Ground", "The Struggle", "ANCSA Plain and Simple", "Beyond the Bottom Line", "ANCSA-Land at Risk"

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

- Natural Resources Curriculum Guidelines

The Conservation Foundation
1255 Twenty-Third Street, NW
Washington, DC 20037

- National conservation organization

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Freeman and Co., W.H.
660 Market St.
San Francisco, CA 94104

- Resources and Man, 1969

Minnesota Instructional Materials Center
3554 White Bear Ave.
White Bear Lake, MN 55110
(616) 770-3943

- Natural Resource Management

National Environmental Education Development
Silver Burdett & Ginn Inc.
Div. of Simon & Schuster
191 Spring St.
Lexington, MA 02173

- Adventure in Environment

National Farm Book Company
P.O. Box 206 - 5149 Highway T.
Wisconsin 54406
(715) 824-5445

- Conservation & Management of Natural Resources in the in the U.S. (College Amherst, Text)
- Investigations In Conservation of Natural Resources

Rhode Island Department of Elementary and Secondary Education
22 Hayes Street
Providence, RI 02908

- Natural Resource Curriculum Guide

University Publishers Inc.
239 Park Avenue South
New York, NY 10003

- The Land Resources of Alaska, by Johnson, Hugh A. & Jorgenson, Hugh A

U.S. Department of Agriculture
Yearbook of Agriculture (Free)
Available from member of congress--only by request.

- Using our Natural Resources

U.S. Government Printing Office
Superintendent of Documents
Washington, D.C. 20402

- "Investigating your Environment", Stock No. 001-001-00446-4
- Career Education in the Environment

The latter is an extensive reference. Contains 110 pages on environmental careers, 156 pages of an environmental education curriculum, and 55 pages of bibliography for environmental science.

Washington, Univ. of, Press
P.O. Box 50096
Seattle, WA 98105

- Indian Fishing: Early Methods on the
- Northwest Coast

John Wiley and Sons
605 Third Ave.
New York, NY 10016
(212) 207-7099

- Conservation and Management of Natural Resources in the U.S.
  A good natural resources text for high schools

Agricultural Mechanics

American Technical Publishers
1155 W. 175th St.
Homewood, IL 60430

- Welding Skills
- Welding Fundamentals
- Welding Technology

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Arizona, University of
Department of Agriculture Education
Tucson, AZ 85721

- Agricultural Mechanics

American Association for Vocational
Instructional Materials
120 Engineering Center
Athens, GA 30602
Excellent Source for Ag. Mechanics

- Ag Mechanics Curriculum
- Catalog of materials

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

- Great source of resources ranging from ag mechanics to "use of surveying level kit."

CIMC
1500 West Seventh
Stillwater, Oklahoma 74074-4364

- Agricultural Mechanics
- Agricultural Mechanics Shop Project Plans

F.M.O by John Deere
John Deere Rd.
Moline, IL 61265
(309) 752-8000

- Mostly tractor material

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

- Shopwork on the Farm

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- A must for ag mechanics teachers. Includes comprehensive series of Apple II-series software on all aspects of ag mechanics--including construction and maintenance. Write for catalog.

Texas A and M University
Vocational Instruction Service
F.E. Box 2588
College Station, Texas 77843-2588
(409) 845-6601

- Student Materials

Animal Science

American Society for Prevention of
Cruelty to Animals (ASPCA)
441 E. 92nd St.
NY, NY 10028

- America's first Humane Society

CIMC
1500 West Seventh
Stillwater, OK 74074-4364

- Agriculture Livestock Skills
- Techniques of Judging Dairy Cattle

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- Extensive resources in animal science. Lots of resources in dairy , cutting meats, raising farm animals. Includes slides, cassettes, videos, and Apple II software.

Instructional Materials Service
Texas A & M University
F.E. Box 2588
College Station, Texas 77843-2588
(409) 845-6601

- Numerous publications on animal science. Specifically, sheep, swine, cattle, poultry. Includes videos and software. Write for catalog.

Vocational Education Productions
California Polytechnic State University
San Luis Obispo, California 93407

- Publications ranging from beef production to buying a horse.

Plant Science

Maryland, University of
Botany Dept.
College Park, MD 20740

- "Methods In Plant Tissue Culture"

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

- Working in Plant Science

Michigan State University
Plant Science Dept.
East Lansing, Michigan 48824

- Demonstrations In Ornamental Horticulture and Plant Science

Mississippi State University
Curriculum Coordinating Unit
Drawer DX
Mississippi State, MS 39762

- Basic Principles of Plant Science

Soil Science/Agronomy

CIMC
1500 West Seventh
Stillwater, Oklahoma 74074-4364

- Materials in voc. agriculture and farm business management.

Cooperative Extension Service
University of Alaska - Fairbanks
303 Tanana Dr.
Fairbanks, AK 99701

- "Soil Fertility For Home Garden and Greenhouse"

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- Great references in soil science. Resources on farm management. Considerable Apple I software on same. Materials applicable to some other natural resources -agriculture fields.

Illinois, Southern Univ. at Carbondale
Dept. Of Agricultural Education
and Mechanization
Carbondale, IL 62901

- "Soils and Fertilizers" (Lesson Plans)
- "Greenhouse Soils" (Lesson Plans)

Instructional Materials Service
F.E. Box 2588
Texas A & M University
College Station, Texas 77843-2588
(409) 845-6601

- Materials in voc. agriculture. Includes color slide programs. A good place for FFA materials. Pre-employment competencies. Also materials for special needs students.

Midwest Library Service
11443 St. Charles Rock Road
Bridgeton, MO 63044
- "Profitable Farming Now"

National FFA Center
5632 Mt. Vernon Memorial Highway
P.O. Box 15160
Alexandria, VA 22309-0160
- Agriculture Audio/Visuals

Soil Conservation Service
U.S. Dept. of Agriculture
209 E. 9th Ave., Suite 300
Anchorage, AK 99501-3687
- America's Soil and Water: Condition and Trends; Good full color reference.
- Conserving Soil; Excellent book: Contains numerous ready to copy teaching masters.

Soil Conservation Society of America
7515 NE Ankeny Road
Ankeny, IA 50021
- Journal of Soil and Water Conservation

Vocational Resources
120 Driftmier Engineering Center
Athens, GA 30602
- Varied resources. From "Farming and the computer to "Solar Livestock Housing Handbook."

Vocational Education Productions
California Polytechnic State University
San Luis Obispo, California 93407
- Many soil science/agronomy publications. Ag ledger software, other ag software and videos.

Horticulture

Ornamental Horticulture

American Association of Nurserymen
230 Southern Building
Washington, D.C. 20005
- American Standard For Nursery Stock

This Organization has many excellent publications. Every teacher should have a copy of their free publications list.

American Association For Vocational Instructional Materials
Engineering Center
Athens, GA 30602
- Applying Pesticides (Student Manual and Workbook and Teacher Guide)

California, University of
Agricultural Extension
- "Fertilizer and Irrigation for Plants on Retail Display"
- "Soils"

Chevron Chemical Co. - Ortho Division
Public Relations
575 Market St.
San Francisco, CA 94105
- "Trees For a More Livable Environment" (Free-They have many other materials)

Clemson University
Cooperative Extension Service
Clemson, SC 29631
- "Insects and Diseases of Ornamentals: How to Control Them" Outstanding color photos of various pests.

Cornell Univ.
Instructional Materials Service
Ithaca, NY 14850
- Innovative Teaching Ideas, Volume I and Volume II

Excellent ready to copy exercises for all areas of agriculture.

Crop Science Society of America
Division C-5, Turfgrass
677 South Segoe Road
Madison, WI 53711
Outstanding!

- "Diseases of Turfgrass" (Slide Set and Full-color Script)

John Deere Co.
John Deere Rd.
Moline, IL 61265
(309) 752-8000

- "Lawn and Garden Safety Savvy" (Free) *Excellent! Cartoon format-Kids love it!*

Diamond Shamrock Agricultural Chemicals Division
617 Veterans Blvd.
Redwood City, CA 94063
excellent 5 pp. Color Booklet

- "Weed and Disease Control In Turf and Ornamentals"

Environmental Design Press
P.O. Box 2187
Reston, VA 22090

- "Business Management Techniques For Nurserymen"

Environmental Protection Agency
Washington, D.C. 20460

- Apply Pesticides Correctly: A Guide For Commercial Applicators
  Excellent, easy to read.

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- Hobar has innumerable publications in this area.

Illinois, Univ. of, at Urbana-Champaign
College of Agriculture
Cooperative Extension Service
Urbana, IL 61801

- "Designing an Energy-Efficient Home Landscape" (Circular 1178)
  Should be particularly useful to Alaska landscapes.

Interstate Printers and Publishers, Inc.
P.O. Box 50
Danville, IL 61834-0050

- 50 Laboratory Exercises For Vocational Ornamental Horticulture

Kentucky, University of
Dept. of Vocational Education
College of Education
Instructional Materials Laboratory
Lexington, KY 40506

- "Various Horticulture Units" (Modules)

Michigan State University
Cooperative Extension Service
East Lansing, MI 48824
Excellent, easy to read.

- Glasshouse Ornamental Disease Control Handbook
- Safe Effective Use of Pesticides: A Manual for Private Applicators Extension Bulletin E-1025

National Center For Research In Vocational Education
Ohio State University
1969 Kenny Road
Columbus, OH 43210

- Horticulture and Agricultural Mechanics Resource Guide for Vocational Education with Microfiche Samples

National Farm Book Company
P.O. Box 206 - 5149 Highway T.
Amherst, Wisconsin 54406
(715) 824-5445

- Ornamental Horticulture: Principles & Practices
- Greenhouse Operation & Management
- How to Build Greenhouses
- Gardener's Solar Greenhouse

North Carolina State Univ.
Dept. of Plant Pathology
Available from Cooperative Extension Service
Raleigh, NC 27650

- "Sick Plants... Why?" (Cir. 576)
  Extremely well illustrated booklet, easy to read: A "Must."

North Central Regional Extension
Available from:
Indiana Cooperative Extension Office
Purdue University
Lafayette, IN 47907
or:
Illinois Cooperative Extension Office
110 Mumford Hall
Univ. of Illinois
Urbana, IL 61801

- Publication No. 26 Outstanding full-color bulletin. Must have!

Ohio Agricultural Research and
Development Center
Wooster, Ohio 44691

- "Insect and Mite Pests of Trees and Shrubs" (Research Bull. 983)

Ohio State University
Agricultural Education Curriculum Materials Service
2120 Fyffe Road
Columbus, OH 43210

- The Nursery Worker (Student Manual and Teacher's Guide)
  Good teacher's guide

O.M. Scotts Co.
Marysville, OH 43040

- Information Manual For Lawns and Gardens
  Excellent 146 pp. reference
- "What's That Weed?"
  Excellent full color booklet--free.

Pennsylvania State University
College of Agriculture
Agricultural Experiment Station
Dept. of Agricultural Education
University Park, PA

- Numerous publications in the area of landscape, turfgrass, pests, and more. Excellent source.

Plantco Inc.
314 Orenda Rd.
Bramalea, Ontario
Canada L6T 1G1

- Plantex Fertilizer Guide for Horticulture and Agriculture

Pro-Lawn Service
P.O. Box 9864
Columbus, OH 43202

- "Pro-Lawn Service Accounting"
- "Application For a Service Business"
  Good for a student with a lawn service SOEP

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

- Working in Horticulture
  Good basic text with workbook

Rateaver, Bargyla and Cylver
Pauma Valley, CA 92061

- Seaweed in Agriculture and Horticulture
  Great section on soils and growing media

Texas A and M Univ
Vocational Instructional Service
College Station, TX 77843

- "Propagating Horticultural Plants"
  Excellent, very complete.

Vocational Education Productions
California Polytechnic State Univ.
San Luis Obispo, CA 93407

- A Suggested Outline For A High School Ornamental Horticulture Curriculum

U.S. Forest Service
Institute of Northern Forestry
Fairbanks, AK 99775-5500

- Several publications regarding landscaping trees and shrubs.

Vocational Education Productions
California State Polytechnic College
San Luis Obispo, CA 93401

- Innumerable resources in ornamental horticulture. Write for catalog.

Vocational Resources
120 Driftmier Engineering Center
Athens, GA 30602

- Mowing and Spraying Equipment

Floriculture

American Can Company
Floral Products Division
Neenah, WI 54956
Excellent materials

- "Floral Design Pointers"
  (A series of leaflets - FREE)

Illinois, University of, at Urbana/Champaign
Cooperative Extension Service
Urbana, IL 61801

- "Flower Arranging "(Cir. 1020)
- "Terrariums: Construction & Maintenance " (Cir. 1086)
- "Pruning Evergreens & Deciduous Trees & Shrubs" (Circular: 1033)

Michigan State University
Cooperative Extension Service
East Lansing, MI 48824

- "Flower Arranging" (Extension Bull. 410)
  The Best!! Must have! Widely used as a text in floral design.

Ohio State University
Agricultural Education Curriculum Materials Service
2120 Fyffe Road
Columbus, Ohio 43210

- Retail Floriculture Book 1 & 2
  Numerous slide sets

Ohio State Univ.
Instructional Materials Laboratory
College of Education
1885 Neil Avenue, Room 112
Columbus, OH 43210

- Task/Activity Analysis for Horticulture
- An Analysis of the Retail Florist Occupation
- An Analysis of the Wholesale Florist Occupation

Pennsylvania State University
College of Agriculture
Agricultural Experiment Station
Dept. of Agricultural Education
University Park, PA

- Retail Flower Shop Operation & Management (Student Manual & Teacher Guide)

Small Business Administration
1441 L St. NW
Washington, DC 20416

- Starting & Managing A Retail Flower Shop
  Excellent book. 121 pp.

Greenhouses

ACME Engineering & Manufacturing Corp.
Muskogee, OK 74401

- The Greenhouse Climate Control Handbook

Alaska, University of--Anchorage
Cooperative Extension Service
Wayne Vandre, Horticulture Specialist
Anchorage, AK 99504

- Proceedings of the Alaska Greenhouse Conferences
  The most up-to-date information available on the Alaska greenhouse industry.

Alaska, Univ. of --Fairbanks
Cooperative Extension Service
University of Alaska - 303 Tanana Dr.
Fairbanks, AK 99701

- A Key To Flower Growing In Alaska
- "Greenhouses in Alaska"

Alberta Public Affairs Bureau
Publication Services
11510 Kingsway Avenue
Edmonton, Alberta Canada T5G-2Y5

- "Biological Pest Management For Interior Planscapes"
  Good booklet

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

- Extensive list of publications in ornamental horticulture. Write for catalog.

Cornell University
Cooperative Extension Service
7 Research Park
Ithaca, NY 14850

- Cornell has many excellent horticultural references, especially in the area of greenhouses.
- "Nutrition of Greenhouse Crops"
  Outstanding booklet. Should be on every reference shelf.

Easi-Build Pattern Co., Inc.
Briarcliff Manor, NY 10516

- "How to Build a Walk-In or Window Greenhouse"

Florida Dept. of Education
Career Education Center
415 N. Monroe St
Tallahassee, FL 32306

- Floriculture (Lesson Planning Manual)
- Floriculture (A catalog of Performance Objectives,
- Criterion-Referenced Measures & Performance Guides

FTD (Florists Transworld Delivery Service)
P.O. Box 2227
Southfield, MI 48037

- "Caring for Indoor Flowers & Plants"
  Excellent full color booklet (33 pp.)
  Obtain through local FTD florist

Georgia, University of
Division of Vocational Education College of Education
Athens, GA 30602

- Introduction to Horticulture

The Hyponex Company, Inc.
Copley, Ohio 44321
Excellent full color booklet - 35 pp.

- "Houseplants: All the Basics You Need Know"

Illinois, Southern, Univ of
Dept. of Agricultural Education & Mechanization
Carbondale, IL 62901

- Controlling the Greenhouse Environment Agricultural Lesson Plans

183

Jiffy-Pot Company of America
West Chicago, IL 60185
- "All About Jiffy-Pots" (Bulletin #100)

48-page illustrated reference (free) provide valuable information on bedding plant production

Kentucky, University of
Dept. of Agricultural Engineering
College of agriculture
Lexington, KY 40506
- "Complete Greenhouse Series"

A series of in-dept bulletins covering all phases of greenhouse environmental control and greenhouse construction

Ohio Florists' Association
Office of the Executive Secretary
Harry K. Tayama
2001 Fyffe Court
Columbus, Ohio 43210
- Wall Charts Covering:
  Insect & Mite Control
  Growth Regulators
  Disease Control

Excellent quick references - should be posted on or near every pesticide storage cabinet

Ohio Agricultural Research &
Development Center
U.S. Rt. 250 and Ohio 835
Wooster, OH
- An Economic Evaluation of Energy Conservation
- Investments for Greenhouses

Ohio State University
Cooperative Extension Service
2120 Fyffe Road
Columbus, Ohio 43210
- Catalog (Free) "Buckeye Publications"
- "The Greenhouse Worker" (Student Manual & Teacher Guide) Good teacher's guide

Other varied references available. Excellent source.

Penn State Industrial Resources & Innovation
225 Pond Lab
University Park, PA 16802
- Greenhouse Energy Conservation
- Greenhouse Crop Production (Student College of Manual & Teacher's Guide)

Purdue University
Cooperative Extension Service
West Lafayette, IN 47907
- "Plants for Indoors" (Bulletin H0-56)
- "Unusual House Plants" (Bulletin 36)

Excellent resource

Reston Publishing Company, Inc.
Reston, Virginia 22090
- Greenhouse Operation and Management
  Advanced

River Farm Corporation
c/o The American Horticultural Society
Mt. Vernon, VA 22121
- "Plants to Beautify The Home"

This is a retail catalog, but it contains excellent color photos of house plants horticulture students must learn.

Texas A& M Agricultural Education
Teaching Materials Center
Texas A & M University
College Station, TX 77843
- Pre-employment Training in Greenhouse Operation
  Resource Material For Lesson Plans in Greenhouses

Wisconsin, Univ. of
Bureau For Career & Manpower Development
State Dept. of Public Instruction
Plateville, Wisconsin,
- Ornamental Horticulture, Greenhouse Management

Vocational Education Media Center
Clemson University
Clemson, SC 29631
- Greenhouse Production
- Floriculture

Vocational Resources
120 Driftmier Engineering Center
Athens, GA 30602

- Greenhouse Crop Production
- Greenhouse Gardening
- Greenskeeping
- Planting
- Tillage

Other varied resources as well.

Vegetable and Fruit Production (Olericulture)

Alaska, University of
School of Agriculture and Land Resources Management
Agriculture and Forestry Experiment Station
Fairbanks, AK 99775

- Cold Coimate Gardening and Root Cellaring in Alaska: An Instructional Guide, Ag. Ed. Pub. #3
  This curriculum guide is a must for gardening instructors.
- Annual reports of variety trials

American Greenhouse Vegetable Growers Association
Box 20228
Columbus, OH 43220
(614) 454-1498

- "Greenhouse Grower" Magazine
- Shares information with growers and suppliers
- *One of the largest, most standard publishers of Vocational Ed*

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- *Extensive resources in this area. Write for catalog.*

Many of the sources named in previous areas also have resources in olericulture.

Land, Air, and Water

Environmental Film Service
P.O. Box 776
408 East Main St.
League City, TX 77573

- "For Generations to Come"
  Highlights the USDA Soil Conservation Service.

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- Soils/ land application-environmental protection resources as well as cassettes/slides. Information on surveying, land management, and natural resources. Also has information on water resources. Write for extensive catalog.

U.S. Army Corps of Engineers
Alaska District
P.O. Box 898
Anchorage, AK 99506-0898
(907) 753-2712
(800) 478-2712

- "Development in Alaska's Waterways and Wetlands"
- "Water Resources Development in Alaska"

Forestry

A & W Publishers, Inc.
95 Madison Avenue
New York, NY 10016

- The Forest World: The Ecology of the Temperate Woodlands

Alaska, all libraries

- North American Forest Lands at Latitudes North of 60 Degrees

Nongame Program ADF&G 333 Raspberry Rd. Anchorage, AK 99502	• Alaska Wildlife Week: Unit: "Alaska's Forests... More than Just Trees"
Alaskan Women in Timber (AWIT) 111 Steadman Street #200 Ketchikan, Alaska 99901	• Alaska's Great Green Forest Free(Alaska Teachers) $5.00(Out of state) • The Forest Book
American Forestry Association 1319 18th Street, N.W. Washington, D.C. 20036	• Woodlands for Profit and Pleasure Inside Wood • Famous and Historic Trees • Ways of the Woods: A Guide to the Skills and Spirit of the Woodland Experience • Knowing Your Trees • "American Forests" Magazine
The American Forest Foundation 1619 Massachusetts Avenue, N.W. Washington, D.C. 20036	• "The American Tree Farmer" Magazine
American Heritage Press A subsidiary of McGraw-Hill Western Regional Office 8171 Redwood Hwy Novato, CA 94947 (415) 897-5293	• The Secret Life of the Forest
American Paper Institute 260 Madison Avenue New York, NY 100016	• "How You Can Make Paper?" (Pamphlet)
American Wood Council 1619 Massachusetts Avenue, N.W. Washington, D.C. 20036	• Some Little Known Facts About Wood
Barnes, A.S. and Company	• Ecology and Our Forests
British Columbia, University of Western Education Development Group Vancouver, B.C. V6T 1W5	• "Forest Nursery Studies" • "Seeing Through the Trees" • The Stump Book • Managing the Forest
British Columbia Worker's Compensation Board 5255 Heather Street Vancouver, B.C. V52 3L8	• Fallers' and Buckers' Handbook *This is an excellent student text.*
California Office of Procurement Publications Section P.O. Box 20191 Sacramento, CA 95820	• California Forestry Handbook
California Polytechnic State University Vocational Education Productions San Luis Obispo, California 93407	• A number of excellent resources in forestry, including slides and other audio-visuals.
Canadian Pulp and Paper Association San Life Building Montreal, Quebec, Canada	• The Forest Harvest (Free)

Control Data Agricultural Products and Services 2001 Killebrew Dr., Suite 333 Bloomington, MN 55420	• "Videotapes and Videodiscs for Agricultural Education"
Cornell University Cooperative Extension Services of the Northeast States Cooperative Extension Service Ithaca, NY 14853	• 4-H Forestry Handbook and Leader's Guide *Excellent for beginning course.* • Burning Wood
Forest Farmers Association Suite 380 4 Executive Park East, N.E. Atlanta, Georgia 30347	• "Forest Farmer" Magazine
Forest Industries Council American Forest Institute 1619 Massachusetts Avenue, N.W. Washington, D.C. 20036	• "Greenamerica " Magazine
Forestree Farmers of Minnesota, Inc. P.O. Box 363 Park Rapids, Minnesota 56470	• "Forest Management Digest"
Forestry AGDEX 300	• "Classroom Demonstrations of Wood Properties" Agdex 300 • "Management of Forest Resources for Multiple Use," Agdex 300/10 • "Falling and Bucking Timber with Safety and Profit," PNW 11. Agdex 300/55.
Forest Products Accident Prevention Association P.O. Box 270 North Bay, Ontario, Canada P1B 8H2 Phone: (705) 472-4120	• "Film and Video Cassette Catalog" *Lists dozens of media items. Rental fee is $10.00 per film.*
4-H National Council 7100 Connecticut Avenue Washington, D.C. 20015	• What's a Tree to Me?
Freeman, Miller 500 Howard Street San Francisco, CA 94105	• Logging Practices: Principles of Timber Harvesting Systems • Timber Cutting Practices • "Forest Industries" Magazine
Harper and Row Publishers, Inc. 10 East 53rd Street New York, NY 10022 (212) 207-7099	• The Living Forest
Hatton, Brown and Co., Inc. Box 2286 485 South Lawrence Street Montgomery, Alabama 36103	• Loggin' Times • Pulpwood Production and Timber Harvesting
Idaho, University of Cooperative Extension Service Moscow, Idaho 83843	• "Safe Chain Saw Operation" Bull. 599

Idaho, University of Cooperative Extension Service College of Agriculture Moscow, Idaho 83843	• "Safe Chain Saw Operation" Bull. 599
Interstate Printers and Publishers P.O. Box 50 Danville, Illinois 61834-0050	• Forests and Forestry • Forestry Curriculum Guide • Pulpwood Production, 34th edition • Chain Saw Manual
Kentucky, University of College of Agriculture Cooperative Extension Service Lexington, KY 40506	• "Measuring Farm Timber" (Bull #FOR-9) • "Obtaining, Seasoning and Burning Wood" (Bull. #AEES-18)
Macmillan Publishing Company 866 Third Avenue New York, NY 10022	• Reading the Woods
Gregg Division/McGraw-Hill Book Co. Western Regional Office 8171 Redwood Hwy Novato, CA 94947 (415) 897-5293	• Forestry and its Career Opportunities • Forest Fire Control and Use • Principles of Silviculture • Forest Management: Regulation and Valuation • Forest Products • Introduction to Forestry
Meadows, Ben, Company 2601-B West 5th Avenue P.O. Box 2781 Eugene, Oregon	• Log Scaling and Timber Cruising
Michigan State University Cooperative Extension Service 1 Morrill Hall East Lansing, Michigan 48824	• Forestry Terms (Bulletin E-1238) • "Forestry Programs for Programmable Calculators"
Milliken Publishing Company 1100 Research Blvd., P.O. Box 21579 St. Louis, MO 63132-0579	• Woodworking: Trees, Wood in the Woodworking Industry
Minnesota, University of Agricultural Extension Service Minneapolis, MN 55455	• "Safe Operation of Logging Equipment" (Folder 628)
National Woodlands Magazine P.O. Box 584 Traverse City, Michigan 49684	• "National Woodlands Magazine"
Nature Study Guide Publishers Box 972 Berkeley, CA 94701	• Master Tree Finder: A Manual For the Identification of Trees by Their Leaves *Catalog of other books*
Northern Logger and Timber Processor P.O. Box 69 Old Forge, NY 13420	• "The Northern Logger and Timber Processor" Magazine

Ohio State University
Agricultural Education Curriculum Materials Service
2120 Fyffe Road
Columbus, Ohio 43210

- "Timber Cruising" (Slide Set)
- Hardwood Lumber Scaling (Slide Set)

Prentice-Hall
ServCode ZQ
150 White Plains Road
Tarrytown, NY 10581

- Elementary Forestry
- "The Deciduous Forest" (Filmstrip)

Project Learning Tree
P.O. Box 129
Tilburone, CA 94920
Also:
American Forest Council
1250 Connecticut Ave., NW
Washington, DC 20036

- Project Learning Tree
  For workshops in your area contact Alaska Department of Fish and Game

Purdue University
Dept. of Forestry and Natural Resources
Agricultural Experiment Station
West Lafayette, IN 47907

- "A Method For Ecological Forest Sampling"

Reedley College
Reedley, CA 93704

- Mathematics for Natural Resources Technicians

Reinhold Company
135 West 50th Street
New York, NY 10020

- Paper Basics: Forestry, Manufacture, Selection, Purchasing, Mathematics and Metrics, Recycling

Ronald Press
P.O. Box 447
St. Louis, MO 63166

- Logging and Pulpwood Products
- Forest Ecology
- Essentials of Forestry Practice
- Wildland Watershed Management

Southern Forest Products Association
P.O. Box 52468
New Orleans, LA 70152

- Trees Forever: An Environmental Challenge
- Our Forests (Booklets and Teacher's Manual)

Stephen Greene Press
Brattleboro, Vermont 05301

- One Man's Forest: Pleasure and Profit from Your Own Woods

Society of American Foresters
5400 Grosvenor Lane
Washington, D.C. 20014

- Forest Cover Types of the United States and Canada
- Choices in Silviculture for American Forests

St. Regis
150 East 42nd Street
New York, NY 10017

- The Life of the Forest
  Outstanding full color booklet. Every student should have a copy. At one time, these were available at no cost.

Syracuse University Press
New York, NY 13210

- Woodland Ecology: Environmental Forestry For the Small Owner

Vance Publishing Corporation
300 W. Adams
Chicago, Illinois 60606

- "Wood and Wood Products" Magazine

Virginia Agricultural Education Service
Div of Voc Ed, State Department of Education
Richmond, Virginia 23216

- "Forestry in Agricultural Education"

Wisconsin, University of
Department of Wildlife Ecology
Cooperative Extension Programs
Madison, Wisconsin 53706

- Extension Service Literature on wildlife, freshwater fishing and forestry

U.S. Forest Service, Alaska Region
Federal Office Building
Box 1628
Juneau, Alaska 99802

- "Alaska's Birch," Alaskan Woods, Series No. 2
- Alaska's Spruce: Sitka Spruce and White Spruce, "Alaskan Woods" Series No. 2
- "Silvicultural Systems for the Major Forest Types of the U.S." Agricultural Handbook Number 445
- Insects and Diseases of Alaskan Forests, Report Number 181, Rev. 10/85
- How A Tree Grows
  Many other publications
- "Intermediate Fire Behavior"

U.S. Forest Service
Pacific NW Forest and Rngr Exp. Station
P.O. Box 3141
Portland, OR 97208

- Glossary of Forest Engineering Terms

U.S. Government
Government Printing Office
Washington, D.C. 20402

- "Introduction to the Fundamentals of Fire Behavior: A Programmer's Learning Tool"
- "Fire Weather: A Guide for Application of Meteorological Information to Forest Fire Control Operations"
- "Fire Management Notes" Magazine

Washington, University of Press
P.O. Box 50096
Seattle, Washington 98105

- American Forest Policy in Development

West Virginia University
Morgantown, WV 26505

- Elementary Timber Measurements

Wiley, John & Sons
605 Third Ave.
New York, NY 10016
(212) 207-7099

- Forest Mensuration
- The Pratice of Silviculture
- Introduction to Forest Science

Fishing & Fisheries

Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, AK 99802
(907) 465-4112

- Provides free information, training and inspections
- Alaska Sport Fish Identification Handbook
- Game Fishes of Alaska
- Wildlife Notebook Series & Teacher's Guide

Alaska Fisherman's Journal
1115 NW 46th
Seattle, WA 98107

- "Alaska Fisherman's Journal" Magazine

Alaska Native Foundation Fisheries Program 4211 West Fourth Ave. Anchorage, AK 99501	• Skiff and Shore: A Teachers' Guide to Fisheries Education Materials
Alaska Northwest Publishing Co. Box 4 EEE Anchorage, AK 99509	• Fisheries of the North Pacific: History, Species, Gear, and Processes • Freshwater Fishes of Alaska • Under Alaskan Seas: The Shallow Water marine invertebrates
Alaska Seafood Marketing Institute 526 Main St. Juneau, AK 99801	• The Network
Alaska Seafood Report 130 Seward St., Suite 501 Juneau, AK 99801	• Quarterly
Alaska, University of Marine Advisory Program Cooperative Extension Service U of A, Anchorage Anchorage, AK 99504	• Bibliography of Marine Teaching Materials
Alaska, University of, Fairbanks Cooperative Extension Service University of Alaska 303 Tanana Drive Fairbanks, AK 99701	• "Utilization and Disposal of Crab and Shrimp Wastes" • "Safety Notes for the North Pacific"
Alaska, University of Alaska Sea Grant Program U of A--Fairbanks Fairbanks, AK 99701	• Alaska Marine Educators Newsletter • Alaska Seas and Coasts • Marine life posters • Publications Directory • Sea Week Curriculum • Alaska Seas and Coasts
Albacore Press P.O. Box 355 East Sound, WA 98245	• The North Pacific Deckhand's and Cannery Worker's Handbook" *An excellent source.*
Aquaculture magazine 610 E. Sixth St. Little Rock, AR 72202	• Bimonthly
Arctic Environmental Information and Data Ctr. (A.E.I.D.C.) 707 A St. Anchorage, AK 99501	• Sea School video tapes
Bering Sea Fisherman 805 W. Third Ave. Anchorage, AK 99501	• Monthly, free
British Columbia Wildlife Federation 5659 176th St. Surrey, BC V3S 4C5	• Salmon posters

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

- "Fish Farming in the 80's"
- "Game Bird Management"

Canada, Fisheries Research Board of
Receiver General for Canada
Canadian Govt. Publishing Ctr.
Ottawa, Canada K1A 0S9

- Pacific Fishes of Canada, Bulletin 180

Dover Publications
180 Varick St.
New York, NY 10014

- The World of the Small Commercial Fishermen: Their Lives and Their Boats

Ellison, Inc.
Edmonds, WA 98020

- Starfish: Guide to Identification and Methods of Preserving

Florida Marine Program
Florida Cooperative Extention Svc.
Institute of Food and Agricultural Science
University of Florida
Gainesville, FL 32611

- Florida 4-H Dept. Marine Library Book List

Hearst Books
Division of William Morrow
105 Madison Ave.
New York, NY 10016

- Piloting, Seamanship, and Small Boat Handling

Interpress Publications
1132 Hamilton St.
Vancouver, BC, Canada V6E 2P1

- Western Fisheries (free)

Kendall/Hunt Publishing Co.
2460 Kerper Blvd.
Dubuque, IA 52001

- A Guide to Marine Coastal Plankton and Marine Invertebrate Larvae

Kodiak Island Borough Schools
722 Mill Bay Road
Kodiak, AK 99615

- Stars Voc Ed Curriculum, Unit 9--"Fisheries"
- "Sea Survival" video tapes

Marine Digest
Room 218, National Bld., 1008 Western Ave.
Seattle, WA 98104

- Weekly

Gregg Division/McGraw-Hill Book Co.
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

- The Life of the Seashore

Mosby, C.V. , Co.
11830 Westline Industrial Dr.
St. Louis, MO 63146

- Textbook of Limnology, 1979

National Fisherman, Pacific Office
4215 21st Ave. West
Seattle, WA 98199

- monthly magazine

National Marine Fisheries Service
709 W. 9th St.
Juneau, AK 99801

- Commercial Fish Species of the Pacific West Coast and Alaska

Nat. Marine Fisheries
2725 Montlake Blvd. E.
Seattle, WA 98112

- Alaska's Fishery Resources-The Sockeye Salmon, Fishery Leaflet 636
- Salmon Rancher's Manual
- Alaska's Fishery Resources-The Pacific Herring
- Northwest and Alaska Fisheries Center Monthly Report
- Marine Fisheries Review

Naturegraph Publishers
Happy Camp, CA 96039

- Field Book of Pacific Northwest Sea Creatures

Nautilus Press
496 Laguardia Place
New York, NY 10012

- Marine Fish Management

Pacific Fishing Magazine
2808 NW Market St.
Seattle, WA 98107

- "Pacific Fishing"

Prince William Sound Aquaculture Corp.
P.O. Box 1110
Cordova, AK 99574

- Aquaculture News, monthly (free)

Science Books Int'l.
% Jones & Bartlett
20 Park Plaza
Boxton, MA 02116

- Aquatic Entomology

Texas A&M Sea Grant College Program
Texas A&M University
College Station, TX 77843

- Sea Sources, by Norma Bagnall

United Fishermen of Alaska
197 S. Franklin St.
Juneau, AK 99801

- "Alaska Fisherman," monthly newsletter

U.S. Fish and Wildlife Service
Office of Public Use and Information
1011 East Tudor Road
Anchorage, AK 99503

- Alaska's Fishery Resources--The Pink Salmon

U.S. Government Printing Office
Washington, DC 20402

- Marine posters of marine mammals, mollusks and crustaceans and marine fishes of the Pacific; Marine mammals stock no. 003-020-00106-8; Mollusks and crustaceans stock no. 003-020-0051-7.
- Our Nation's Wetlands, stock no. 041-011-0045-9.

U.S. Coast Guard auxiliary
National Supply Center
Warehouse 1 Bay 5
Granite City, IL 62040

- Boating Skills and Seamanship
  An excellent complement to Chapman's guide

Washington, University of Press
P.O. Box 50096
Seattle, WA 98105

- Pacific Salmon
- Field guide to the fish of Puget Sound and the Northwest Coast
- Pacific Seashores

Waterfront Press
1115 NW 46th St.
Seattle, WA 98107

- Ocean Leader Seafood Quarterly

Outdoor Recreation

Alaska Geographic Society
Box 4-EEE
Anchorage, AK 99509

- Alaska-Yukon Wildflowers Guide

Alaska Natural History Association (ANHA)
% National Park Service
2525 Gambell St.
Anchorage, AK 99503

- Publications on Alaska's National Parks and associated features.

Alaska Natural Resource and Outdoor Education association (ANROE)
P.O. Box 110536
Anchorage, AK 99511-0536

- Both state and national curricula, training, support, and other resources

Alaska Outdoor Council
3417 Katlian
Eagle River, AK 99801

- Information on outdoor recreation in the state.

Alaska, Univ. of--Fairbanks
Center for Cross-Cultural Studies
UAF, Fairbanks, AK 99701

- Curriculum for the Alaskan Environment, Small High Schools Project

Alaska, Univ. of Museum
Fairbanks, AK 99701

- Checklist. Birds of Alaska, by Gibson, D.D.
- Checklist of Mammals of Alaska.

Atlantic Richfield Co.
P.O. Box 100360
Anchorage, AK 99510

- Wildlife of the North Slope by Angus Gavin

Audubon Society, National
Nature Center Planning Div.
950 Third Avenue
New York, NY 10022

- Manual of Outdoor Interpretation

Center for Environmental Education
Director of Education
624 9th St. NW
Washington, DC 20001

- The Ocean: Consider the Connections

Cispus Center
2332 Cispus Road
Randle, Washington 98377
(206) 497-7131

- Educational opportunity for teachers. Environmental science workshops. Good lesson plans.

Environmental Film Service
P.O. Box 776
408 East Main St.
League City, TX 77573

- "Outdoor Classrooms: Where Do We Go From Here?"

Fairbanks North Star School District
Box 1250
Fairbanks, AK 99707

- Enrichment activities for Outdoor Learning

194

Houghton Mifflin Co.,
Wayside Road
Burlington, MA 01803

- A Field Guide to Western Birds, Peterson
- A Field Guide to the Mammals
- A Field guide to Animal Tracks

The Interstate Printers and Publishers Inc.
P.O. Box 50
Danville, IL 61834-0050

- Tips and Tricks in Outdoor Education
- Hundreds of Ideas for Outdoor Education

National Park Service
2525 Gambell St.
Anchorage, AK 99503

- Alaska Regional Office.

U.S. Forest Service
Environmental Education Coordinator
P.O. Box 1628
Juneau, AK 99802

- "The Common Plants of the Muskegs of Southeast Alaska"
- Guide to Alaska Trees
- "Environmental Education Resources for Alaska", Report No. 85
- The Common Plants of the Hemlock-Spruce Forest of Alaska

U.S. Government Printing Office
Washington DC 20402

- Federal Outdoor Recreation Programs
- Outdoor Recreation Trends
- Quest for Quality
- Federal Assistance in Outdoor Recreation
- The Third Wave
- Private Assistance in Outdoor Recreation

Books

Petzoldt, Paul, The Wilderness Handbook

Van Matre, Steve, Acclimitizing

Self-Sufficiency

Alaska Geographic Society
Box 4-EEE
Anchorage, AK 99509

- Alaska's Native People

Alaska State Museum
Juneau, Alaska 99811

- Fishing and Hunting of Tlingit Men, Traveling Museum Kit

Alaska, University of, Anchorage
Adult Literacy Laboratory
3211 Providence Dr.
Anchorage, AK 99508

- Aleut Basket Weaving

Alaska, University of, Fairbanks
Cooperative Extension Service
303 Tanana Dr.
Fairbanks, Alaska 99701
or local extension office

- "Easy Steps for Canning Salmon"
- "Pickling Fish"
- "Smelt"
- "To Salt Fish"
- "The Fisherman Returns"
- "Pressure Canning Alaska Fish at Home"
- "All About Alaska Clams"
- "Hypothermia--Cold Blooded Killer"
- "Some ABC's of Fo'c'sle Living"
- Wild Edible and Poisonous Plants of Alaska
- "Alaska's Game is Good Food"
- "Tanning at Home"
- Reindeer Roundup Slides

Alaska, University of, Fairbanks Museum Fairbanks, Alaska 99701	• Eskimo Grass Baskets, Traveling Museum Kit • Sea Mammal Hunting in Western Alaska, Traveling Museum Kit
Anchorage Community College 2533 Providence Ave. Anchorage, AK 99504	• Fishwheels and How to Build Them
Emerson Books Reynolds Lane Buchanan, NY 10511	• Netmaking
Friends of the Earth (FOE) Box 104432 Anchorage, AK 99510	• "NOT MAN APART"
Hearst Books Div. of William Morrow 105 Madison New York, NY 10016	• The Guide to Self-Sufficiency
Mother Earth News Box 70 Hendersonville, NC 28739	• Articles on self-sufficiency.
Oregon State University Extention Service OSU Marine Science Center Newport, OR 97365	• "Sportsman's Guide to Handling, Smoking, and Preserving Coho Salmon, Building a Small Crab Cooker for Home Use, Home Freezing of Seafood, Smoking Fish at Home--Safely."
South East Regional Resource Center 218 Front St. Juneau, AK 99801	• Root, Stem, and Leaf, Native Wild Edible Plants of Southeast Alaska, how to spot, and cook them. *Out of print, but copies are on hand.*
Tanana Chiefs Conference Tanana Survival School 102 Lacey St. Fairbanks, AK 99701	• Beaver Trapping • Making Snowshoes • Tanning Moosehide and Making Babish & Rawmane • "Building a Birch Bark Canoe," videocassette • "Fish Wheel," videocassette • "Fishing on the Yukon," videocassette • "Moose Hide Tanning," videocassette
Tundra Times Box 1287 Fairbanks, Alaska 99701	• Weekly newspaper, often features articles on subsistence

Books

Anchorage Daily News, 1966, The Village People
Brow, Terry & Hunter, Rob, Concise Book of Winter Camping
Burmeister, Richard A., The How Book on Dog Sled Construction and Equipment
Guild, Ben, The Alaskan Mushroom Hunters Guide
Hulten, Eric, Flora of Alaska and Neighboring Territories
Oswalt, Wendell H., 1967, Chandler Publishing Co., San Francisco, Alaskan Eskimos
Ray, Dorothy Jean, Artists of the Tundra and the Sea, Univ. of Washington Press, Seattle, 1967
Rustrum, Calvin, Paradise Below Zero
Vanstone, James, Aldine Publishing Co, Chicago, 1974, Athapaskan Adaptations: Hunters and Fishermen of the Subarctic Forests

Films

Canada, National Film Board of," How to Build an Igloo, Land of the Long Day, Parts I and II, AT The Caribou Crossing Place, AT The Autumn River Camp, At the Winter Sea Ice Camp, At the Spring Sea Ice Camp, Stalking Seal on the Spring Ice, Jigging for Lake Trout, Group Hunting on the Spring Ice, Building a kayak, Fishing at the Stone Weir, Deadfall Trap."
Encyclopedia Britannica Films, "Eskimos--Winter in Western Alaska"
Indiana University Audio-Visual Center, "Life in Cold Lands"
Scott, filmstrip--3 parts; "Eskimos of St. Lawrence Island"
Walt Disney Productions, available from Fairbanks North Star School District "Eskimo Hunting and Gathering Food, Transportation in Arctic Regions"

Wildlife

Alaska Dept. of Fish & Game
Box 3-2000
Juneau, AK 99802

- "Fish & Game" Magazine
- Wildlife Notebook Series
- Alaska's Wildlife and Habitat, Vol. I and II
- "Game Fishes of Alaska", posters
- "Major Ecosystems of Alaska," posters
- "Fish & Game Bulletin"
- "Common Fresh & Saltwater Fishes of Southeastern Alaska," Bull. No. 1792

Alaska Dept. of Fish & Game
Fairbanks Regional Office
1300 College Road
Fairbanks, AK 99701
452-1531

- Many films, filmstrips, and videotapes on Alaska wildlife write or call for list.
- Alaska Wildlife Watcher Reports
- Landscaping for Wildlife in Alaska
- Birdhouses for Alaska

Alaska State Film Library
Dept. of Education
Pouch G
Juneau, AK 99811

- Hundreds of films and videotapes about wildlife and habitat; write for list.

Alaska Dept. of Fish & Game
Nongame Program
333 Raspberry Rd.
Anchorage, AK 99502
Contact Sue Quinlan or Jeff Hughes

- Guide to Wildlife Viewing in Alaska
- Winter Bird Feeding in Alaska
- Landscaping for Wildlife in Alaska
- Birdhouses for Alaska
- Alaska Wildlife Week - Assorted units on wetlands, wildlife habitat, wildlife population dynamics, Alaska's forest ecosystems, arctic tundra ecosystem, ecological principles

Alaska Geographic Society
Box 4-EEE
Anchorage, AK 99509

- Alaska Whales and Whaling
- Mammals of Alaska

Alaska Northwest Publishing Co.
Box 4 EEE
Anchorage, AK 99509

- A Field Guide to the Birds of Alaska by R.A. Armstrong
- Reptiles and Amphibians in Alaska, the Yukon and Northwest Territories

Alaska Public Lands Information Center
Offices in Anchorage, Fairbanks, Tok, Ketchikan

- Information on wildlife on federal lands.

Alaska SeaWeek Program
CHRD--Dept. of Education
UAF
Fairbanks, AK 99775-0900

- 1983 "Be it Ever so Humble, There's No Place Like Habitat
- 1984 "Water, Wetlands, and Wildlife"
- 1985 "Wildlife for the Future"

Interior Alaska Trappers
Box 60418
Fairbanks, AK 99706

- "Alaska Trapper" Magazine

American Cetacean Society
P.O. Box 4416
San Pedro, CA 90731

- Gray Whale Teaching Kit

Arctic Environmental Information and Data Ctr.
(A.E.I.D.C.)
707 A St.
Anchorage, AK 99501

- Alaska Quest film series

Audubon Society, Anchorage
P.O. Box 1161
Anchorage, AK 99510

- "Alaskan Bird Chart" and "A Guide to the Audubon Alaska Birds Chart," large poster with color photos and map showing migration routes
slide shows on Potter's Marsh and Pribilof Islands

Audubon Society
Alaska Regional Office
308 G St.
Suite 219
Anchorage, AK 99501

- "Last Stronghold of the Eagles", film about the Chilkat River in Southeast Alaska
- "Audubon" Magazine

British Columbia, Ministry of Environment
Information Services Branch
Parliament Building
Victoria, B.C. V8W 3E1

- Posters with excellent drawings of wildlife , each outlining life histories of wildlife. Hoofed animals (mountain goats, sheep, bison, and moose); furbearers (coyote, wolf, beaver, bear, lynx, river otter). Cost: $4.00/set or $8.00 for two sets.

British Columbia, University of
Western Education Development Group
Vancouver, Canada V6T 1W5

- The Beach Book
- The Creek Book
- Estuary Studies
- The Lake Book
- The Pond Book
- The Snow Book

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

- "Managing Wildlife"
- "Game Bird Management"

Ducks Unlimited
One Waterfowl Way
Long Grove, IL 60047

- "Ducks Unlimited" Magazine

ERIC Clearinghouse for Environmental Materials
3rd Floor
1200 Chambers Road
Columbus, OH 43212

- Multidisciplinary Wildlife Teaching Activities

Fish and Wildlife Reference Service Sterling Software Federal Systems Group 6011 Executive Blvd. Rockville, MD 20852	• Computerized information system and repository that provides state research information • Fish and Wildlife Reference Service Letter
Greenpeace Box 104432 Anchorage, AK 99510	• Strong conservation advocates.
Kansas, University of Museum of Nat. History Lawrence, KS	• "Mammals of Northern Alaska", Misc. Publ. No. 8
Hobar Publications 1234 Tiller Lane St. Paul, MN 55112 (612) 633-3170	• Fish and Wildlife of The Upper Midwest and Related Review, 400 questions in five files dealing with birds, mammals, fish & insects. Apple II series computers, TRS 80 III,4
Jenny Publishing Co. 57 Queen Ave., S. Minneapolis, NM 55405	• 24 outdoor classroom guides dealing with wildlife and wildlife habitats.
Gregg Division/McGraw-Hill Book Co Western Regional Office 8171 Redwood Hwy Novato, CA 94947 (415) 897-5293	• Wildlife Management, Vol. I and II, Agex 300/30
National Farm Book Company P.O. Box 206 - 5149 Highway T. Amherst, Wisconsin 54406 (715) 824-5445	• Deer and Deer Hunting • Successful Bow Hunting • Bear in Their World • Bear Hunting
National Park Service Alaska Area Office Room 202 540 West 5th Ave. Anchorage, AK 99501	• Films on national parks and conservation
National Wildlife Federation Box 103782 Anchorage, AK 99570 *Contact: Bucky Dennerlein*	• "The Class Project" • Nature Quest Workshops • "National Wildlife" Magazine • Has two units with Alaska-specific materials on wetlands and wildlife habitat *Contains a wealth of learning activities on many areas of Natural Resources Management.*
The Nature Conservancy 1800 North Kent Street Arlington, Virginia 22209	• "Nature Conservancy Financial Report"
Pacific Search Press 222 Dexter Ave. N Seattle, WA 98109	• Marine Mammals of the Eastern North Pacific and Arctic Waters
Scavengers-Science Education Supplies Box 81411 College, AK 99708	• Butterflies of Alaska, color poster

Simon and Schuster Inc.
1230 Avenue of the Americas
New York, NY 10020

- Gulls

Stackpole Books
Box 1831, Cameron and Kelker Streets
Harrisburg, PA 17105

- Ducks, Geese, and Swans of N. America

U.S. Fish and Wildlife Service
Office of Public Use and Information
1011 East Tudor Road
Anchorage, AK 99503

- Posters depicting habitat and wildlife of south central Alaska.
- Films and wildlife and conservation.

U.S. Geological Survey
101 12th Avenue, Box 12
New Federal Bld.
Fairbanks, AK 99701

- Topographic and geographic maps of Alaska

U.S. Government Printing Office
Washington, DC 20402

- "Ducks at a Distance--A Waterfowl Identification Guide;" Stock No. 024-010-00442-8.
- "A Host of Seabirds, Alaska," 6 small color posters.

Washington, Univ. of, Press
P.O. Box 50096
Seattle, WA 98105

- Marine Birds and Mammals of Puget Sound

Western Regional Environmental
Education Council
Alaska Wildlife Week
Dolores Scott, ADF & G
Box 3-2000
Juneau, AK 99802

- Project Wild (Secondary Activity Guide)
Single biggest effort in Education; annually produced instructional materials effecting a theme related to Alaska specific wildlife. Excellent activities for wildlife ecology and management.

The Wildlife Society
Suite 611
7101 Wisconsin Avenue, N.W.
Washington, DC 20007

- The Ways of Wildlife

Alaska Chapter:
c/o John Shoen
800 Fritz Cove
Juneau, AK 99801

- "Wildlife and the Old-Growth Forest of Southeast Alaska" (available as slide show or video)

Woodstream Corporation
Niagara Falls, Ontario, Canada L2E-6T3

- Trapping and Wildlife Management

Books

Dufrense, Frank, Alaska's Animals and Fishes
Everett, Michael , Birds of Prey
Freeman, W.H. and Company, San Francisco, CA, Wildlife Management
Murie, Adolph, A Naturalist in Alaska

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